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Volume 35

OCTOBER, 1952

Number 10

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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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CANCER DETECTION

Report from the Center at the University of Minnesota

T. BRANNON HUBBARD, Jr., M.D.*
and
DAVID STATE, M.D.
Minneapolis, Minnesota

SINCE the institution of the first Cancer Detection Center in this country in 1937,¹ there has existed considerable controversy among the medical profession regarding the attributes and shortcomings of such centers. Those reports that have appeared in the literature^{1,2} have concerned clinics which dealt only with the so-called "accessible" cancers, and which made no attempt to detect gastrointestinal neoplasms. Even as regards only exterior cancers, such reports seem to agree that further refinements in screening techniques are needed to make cancer detection clinics generally practicable.

The Cancer Detection Center at the University of Minnesota was begun on March 1, 1948, with the approval of the Minnesota State Medical Association.² Its purposes were threefold:

1. To see if such a program which included search for gastrointestinal cancers, was feasible and practical for use on a broad scale.
2. To evaluate various screening methods, in the hopes of formulating a relatively brief, economical program which could be used throughout the country either in smaller centers or ideally by the individual physician in his office.
3. To benefit immediately those patients who were examined by this center, although obviously they could constitute only a minute fraction of the population in this area.

From the Department of Surgery, University of Minnesota Medical School. Sponsored by the Council of the Minnesota State Medical Association and supported in part by the Minnesota Division of the American Cancer Society.

*Dr. Hubbard's present address is 1211 Forest Avenue, Montgomery, Alabama.

The following is a brief summary of the results of the four years, March 1, 1948, to March 1, 1952.

Presentation of Data

Material.—Only "symptom-free," apparently well individuals, forty-five years of age and over, are examined. They are instructed (1) to eat no meat products for three days before examination and to bring a stool and urine specimen with them, and (2) to clean the lower bowel by repeated tap water enemas until clear the night and morning before their examination.

Procedure.—A thorough history form is filled out by the patient. This form, based on true and false columns, covers habits, family history, and all symptoms which might conceivably suggest a malignancy.

All are given a routine examination which occupies the greater part of one day.

In the morning:

1. Complete blood count.
2. Urinalysis.
3. Blood Wassermann test.
4. Occult blood in the stool (both by guaiac and benzidine tests) after a meat-free diet for three days.
5. Gastric expression, using histamine (1 dose, 0.5 mg) as a gastric stimulant.
6. A proctoscopic examination by a proctologist.
7. Female patients have a complete pelvic examination by a gynecologist, with Papanicolaou smears.
8. Photofluorogram of chest.

In the afternoon:

1. Ear, nose and throat examination by an otolaryngologist.
2. General physical examination by one of our doctors with correlation of all findings including the history form.

CANCER DETECTION—HUBBARD AND STATE

The latter doctor then discusses the results with the patient and the patient is told to return to his family doctor for more detailed information. In particular, if any cancer or similar lesion is found,

TABLE I. TYPES OF CANCER FOUND AT THE CANCER DETECTION CENTER (March 1, 1948 to March 1, 1952)

Location	Number of Cases
Stomach	10
Colon	19
Duodenum	1
Breast	6
Cervix	4
Ovary	3
Prostate	5
Skin	22
Lymphosarcoma	4
Leukemia	3
Total	77

the patient is told to return to his doctor for immediate treatment. No therapy is given at the Center. Each patient is required to give the name of his personal physician, and to the latter is sent a complete résumé of our findings with our recommendations.

The above ends the routine examination. Further x-ray studies, aimed at the "inaccessible" cancers, are taken only for specific indications and at a later date by appointment.

With occasional exceptions, these x-rays are of only two types. They are as follows, and are taken when any one of the listed criteria are present.

1. X-rays of the stomach with barium meal, when one or more of the following pertains:

- Individuals with histamine achlorhydria and hypochlorhydria (less than 30 degrees of free acid).
- Patients with occult blood in the stool.
- Patients with a strong family history of gastric carcinoma.
- Patients with an unexplained hemoglobin level below 11.0 grams.
- Patients with vague symptoms of gastric pathology which in any sense could be interpreted as being due to gastric carcinoma by the examining physician.

2. X-rays of the colon after barium enema, with or without air contrast studies, when one of the following pertains:

- Patients with abnormal findings on proctoscopic examination.
- Patients with occult blood in the stool.
- Patients with an unexplained hemoglobin level below 11.0 grams.
- Patients with a family history of large bowel malignancy.
- Patients who have vague symptoms that could possibly be conceived as being due to malignancy of the large bowel by the examining physician.

TABLE II. PRECANCEROUS LESIONS FOUND AT THE CANCER DETECTION CENTER (March 1, 1948 to March 1, 1952)

	First Examination	Recheck Examination	Total
Polyps of colon and rectum	532	337	869
Gastric polyps	2	0	2
Kraurosis vulvae	15	7	22
Leukoplakia	115	51	166
Irritated nevi	230	49	279
Polyps of vocal cords	1	0	1
Senile keratosis	139	81	220
Thyroid adenomas	72	34	106

With rare exceptions the other more intricate examinations, such as intravenous pyelography, gastroscopy, et cetera, are not done here but are recommended to the patient's personal physician.

Follow-up.—The personal physician is asked to notify us when the patient returns to him and to let us know if his findings coincide with ours. All patients with the diagnosis of malignancy are followed and a report of the pathological findings is obtained. Thus all cancers listed in the results below are microscopically proven.

All masses, designated by us as "suspicious tumors" are also followed. When such lesions are excised, they are then relegated into the list of malignant or benign tumors as indicated.

All patients are asked to return for recheck examinations which are the same as the first. Such examinations recur at intervals of approximately one year. Remarkably few patients have failed to return for their recheck appointments, and at the present time five "recheck" patients are being examined for every one new patient.

Results.—8,230 examinations have been made on 4,352 patients (2,153 men; 2,199 women). Our findings have been as follows:

- 77 cancers (including three cases of leukemia). (Table I)
- 1,632 "precancerous" lesions. (Table II)
- 2,536 benign tumors.
- 125 suspicious tumors which required further diagnostic procedures.
- 6,427 non-cancerous conditions which were worthy of medical attention.

Analysis

If one makes no discount for the original outlay for permanent equipment, including x-ray apparatus, the seventy-seven cancers were found at a cost of approximately \$3,400 each. Obviously to each of these seventy-seven patients this was a worthwhile expense. However, as a measure to

CANCER DETECTION—HUBBARD AND STATE

be applied to the population as a whole, there is some doubt as to the practicability of such an examination as a purely therapeutic venture. Aside from actual dollars there is also, of course,

If one had taken x-rays only for achlorhydria or hypochlorhydria and only in patients of fifty-five years or more, one would have found 5.1 cancers per 1,000 x-rays or 10.6 cancers per 1,000

TABLE III. INCIDENCE OF CANCER FOUND AT THE FIRST EXAMINATION IN RELATION TO AGE AND SEX, CANCER DETECTION CENTER (March 1, 1948 to March 1, 1952)

Age	Cancers per 1000 Examinations	
	Men	Women
45-54 years	6.4	6.8
55-64 years	15.8	15.6
65 years +	26.9	12.2
Total	12.4	10.5

some doubt as to whether such examinations carried out on a nation-wide scale and finding a similar incidence of cancers, would yield results deserving of the time expended by the doctors, nurses and technicians required.

Based upon the supposition that early detection of cancer is worthwhile, and that a more economical (re both time and money) examination is desirable, a preliminary analysis of our data has been made:

(A) *Total Results.*—9.3 cancers were found per 1,000 examinations (11.9 cancers per 1,000 first examinations and 6.4 cancers per 1,000 recheck examinations).

(B) *Total Cancers.*—If one breaks down our results in regard to age, sex, first examinations, and recheck examinations, the incidences are as shown in Tables III and IV. It is apparent, and of course is to be expected, that a much more fruitful examination could be done if one dealt only with patients over the age of fifty-five years.

An exception to this rule is the woman with cancer of the cervix, all four of the latter having occurred in patients under fifty-five years of age.

(C) *Gastrointestinal X-rays.*—5,233 stomach x-rays have been made on 2,881 patients, and ten gastric cancers and two gastric polyps have been found. This is an incidence of 3.4 cancers per 1,000 patients or 1.9 cancers per 1,000 x-rays. Although these examinations were based on one or more of the indications listed above, the only characteristics common to all ten gastric cancers were a low free acid on gastric analysis, and an age of over fifty-five years.

TABLE IV. THE INCIDENCE OF CANCER FOUND ON RECHECK EXAMINATIONS, IN RELATION TO AGE AND SEX, CANCER DETECTION CENTER (March 1, 1948 to March 1, 1952)

Age	Cancers per 1000 Examinations	
	Men	Women
45-54 years	2.1	5.2
55-64 years	7.1	7.0
65 years +	12.2	30.3
Total	5.3	7.9

patients; the incidence of cancer in the men being 1.7 times that in the women.

(D) *Barium enema X-rays.*—3,443 colon x-rays were taken on 1,711 patients, and eight cancers and twenty-six polyps were found which were above the reach of the proctoscope. This is an incidence of 2.3 cancers per 1,000 examinations, or 4.6 cancers per 1,000 patients. The indications for x-rays in the case of both the cancers and the polyps were based either on abnormal proctoscopic findings or on the presence of occult blood in the stool. The age of these patients ranged over all three decades, however, and involved both sexes to approximately equal degrees.

If one had taken x-rays based only on proctoscopic findings, or on occult blood in the stool, one would have found 8.8 cancers per 1,000 x-rays or 11.0 cancers per 1,000 patients, and no polyps or cancers would have been missed.

(E) *Papanicolaou Smears.*—Approximately 6,000 smears have been studied. However, all four proven cervix cancers were picked up by biopsy, before the smears were read, and two of the latter were read as false negatives. There is one Class IV smear, not counted as a cancer, which is as yet unconfirmed by repeated and thorough biopsy and curettage. These results suggest that, when a thorough pelvic examination is done, with biopsy of suspicious areas, the Papanicolaou smear may be a rather redundant luxury in women over forty-five years of age; although, of course, it may well be a very valuable

CANCER DETECTION—HUBBARD AND STATE

procedure when such a pelvic examination cannot be done due to shortages of time or personnel.

(F) *Proctoscopic Examination.*—The worth of this maneuver is shown, both by the fact that of

TABLE V. INCIDENCE OF RECTO-SIGMOID POLYPS FOUND AT THE FIRST EXAMINATION CLASSIFIED BY AGE AND SEX
(March 1, 1948 to March 1, 1952)

Age	Men	Women
	Per Cent with Polyps	Per Cent with Polyps
45-54 years	17	8.0
55-64 years	15	9.5
65 years +	17	9.0

the nineteen cancers of the rectum and colon, seventeen were picked up directly or indirectly by proctoscopy; and by the fact that benign rectal polyps have been found on proctoscopy in one out of eight first examinations, and in one out of ten recheck examinations.

As may be seen in Tables V and VI, there was a slightly greater incidence of polyps in men than in women. However, in both sexes the yield from this relatively innocuous procedure was sufficiently high to make it worthwhile.

(G) *Other Tests.*—No cancers were led to by the routine urine examination, Wassermann examination, or chest x-ray, the latter probably reflecting the state-wide chest survey.

Although three leukemias were found, two of these were suggested by lymphadenopathy. Hence, it is probable, especially in view of the inefficacy of treatment at present, that the routine leukocyte count is superfluous in such a program.

Oddly enough, no cancers were found based upon a low hemoglobin alone, and this test may on further examination prove superfluous in asymptomatic patients, when x-rays are taken for the previously described indications.

Discussion

It has been inferred by some that early diagnosis by present-day methods will offer little improvement in our "cure-rate" of cancer. However, that early diagnosis of asymptomatic cancer is of some value is suggested by the fact that, of the seventy cancers found at this center (excluding seven leukemias and lymphosarcomas),

77.1 per cent were early, without demonstrable lymph node metastases: 50 per cent of the stomach cancers, 83 per cent of the colon and rectum cancers, 50 per cent of the breast cancers, 100 per cent of the ovarian and cervix cancers

TABLE VI. INCIDENCE OF RECTO-SIGMOID POLYPS FOUND AT RE-CHECK EXAMINATION (PATIENTS NEGATIVE AT FIRST EXAMINATION), CLASSIFIED BY AGE AND SEX
(March 1, 1948 to March 1, 1952)

Age	Men	Women
	Per Cent with Polyps	Per Cent with Polyps
45-54 years	10.5	6.8
55-64 years	15.0	9.0
65 years +	10.2	10.9

(i.e. Stage I). This proportion of lymph-node-free cases is, of course, considerably higher than that found in the usual hospital population. It is generally recognized that such localized cancers have a much higher survival rate; and even in the stomach malignancies, generally regarded pessimistically, our experience at the University Hospitals has revealed a five-year survival rate of 50.4 per cent in those cases without lymph node metastases at operation.

Moreover, the ultimate salvage resulting from the removal of the 1,632 precancerous lesions cannot be fully evaluated.

Although there is little doubt that a system of examination as has been outlined above is too time consuming and expensive to be applied to the whole population, it should be possible to judiciously modify such an examination until it is brief, economical and feasible. It is the purpose of this clinic to define such a modified program. No attempt has, however, been made to subject the above data to detailed statistical analysis for the following reasons. In the first place the number of cancers found of any one type is as yet too small, and any critical analysis should of course treat each cancer type separately since each one involves different age groups, sex ratios, and symptomatology. Secondly, in spite of the efforts made, one can never be certain that those patients who come to the Center for the first time are truly asymptomatic. It is quite possible that some of such new patients come because they have symptoms, and they are therefore selected. To

CANCER DETECTION—HUBBARD AND STATE

arrive at any conclusions concerning an ideal examination for the asymptomatic population at large we should deal in our analysis only with "recheck" patients, those who gave negative findings at their first examination, and who came back for re-examination, not because they wanted to, but because they were asked to return.

Nevertheless the above preliminary analysis is suggestively reliable since it coincides quite closely with what we know about these various cancers. For this reason a tentative program is suggested below:

1. Only patients over the age of fifty-five years to be examined.
2. Laboratory work to consist only of gastric analysis and examination of the stool for occult blood.
3. A routine physical examination for all patients.
4. Proctoscopy for all patients, after proper preparation.
5. A pelvic examination consisting only of bimanual palpation, but not including the use of the speculum or of the smear.*
6. X-rays of the stomach in those patients revealing less than 30° of free acid on gastric analysis.
7. X-rays of the colon in those patients showing abnormal proctoscopic findings or occult blood in the stool.
8. X-rays of the chest, only if a state-wide survey has not been made in that area.

*In this age group, such an examination is necessary for the detection of ovarian or fundic cancers. Pelvic examination of women younger than 55 years would be directed more toward cervical cancers and should constitute an entirely separate program.

It should be re-emphasized that the above is only a theoretical outline, and that final conclusions concerning the ideal program must await the accrual of more material. It should also be said that the effectiveness of any of these examinations, even the simpler ones, such as examination of the skin, breasts, rectum, and vagina, depend entirely for their effectiveness upon a very high index of suspicion. One must look not for the obvious cancer, but for the ulcer or lump which could be benign but *might* be a cancer.

It may also be stressed that the deletion of various details of physical examination and of laboratory examination in the above tentative detection program does not infer that such details are of no value, but that they merely appear less essential if one is striving for economy of effort and time.

Summary

A résumé of the first four years work of the Cancer Detection Center at the University of Minnesota has been presented, and a theoretical program has been suggested by which one could conduct a detection clinic more economically and almost as effectively. Any final conclusions regarding such an "ideal" examination must, however, await the accumulation of larger numbers of unselected, recheck patients who are reliably asymptomatic.

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BENTYL HYDROCHLORIDE AND GLAUCOMA

Chronic simple glaucoma is undiagnosed in one out of every forty people forty years of age or older. Undiagnosed glaucoma may be precipitated by the use of atropine, belladonna, and many of the newer autonomic blocking drugs. These drugs have a tendency to increase intraocular pressure and thus bring on an attack of heretofore clinically unrecognized glaucoma.

Two patients suffering from glaucoma have been treated, because of irritable colon syndrome, with Bentyl hydrochloride. Although Bentyl has considerable atropine-like action on the gastrointestinal tract, it does not produce pupillary changes that might influence intra-

ocular pressure. These known glaucoma cases (both were female, aged 60 and 70) received Bentyl 10 mg., four times daily by mouth for two to four weeks. "Intermittent Bentyl therapy has been continued for over one year in each case without producing dilatation of the pupil or an increase in the ocular pressure. Both patients have continued local use of 2 per cent pilocarpine in the eye, which has not interfered with the antispasmodic effect of Bentyl upon the gastrointestinal motility."—From Hufford, A. R.: Bentyl hydrochloride—Successful administration of a parasympatholytic antispasmodic in glaucoma patients. Am. J. Digest. Dis., 19:257-258, 1952.

SOME FUNCTIONAL DISORDERS OF THE SMALL INTESTINE OF CLINICAL IMPORTANCE

Carman Lecture

ROSS GOLDEN, M.D.
New York, New York

TO THE Minnesota Medical Society I wish to express my deep appreciation of the invitation to give the Carman Lecture of 1952. At the time Russell Carman was making his important contributions very little attention was paid by either clinicians or radiologists to the small intestine. He would have been much interested in and would have contributed to the remarkable advances which have occurred in the radiologic study of this important part of the digestive tract, as have his successors in the division of Roentgenology of the Mayo Clinic.

Disease or disorders of the small intestine may be disclosed incidentally during a radiologic examination of the stomach and duodenum, or, in rare instances, during an examination of the colon. The best way to study the small intestine by x-ray is to follow a barium suspension through its entire length by films at regular intervals, and fluoroscopic observations.

The three major indications for a small intestine study are: (1) diarrhea; (2) intestinal bleeding; (3) abdominal pain, particularly located in the perumbilical region or the right lower quadrant, assuming that disease in the more common sites in the stomach and large intestine has been ruled out by appropriate examinations.

I shall review first some facts concerning the motor physiology of the small intestine which seem to have a bearing on the phenomena demonstrable by x-ray methods. I will then discuss some disorders of neurogenic origin, the effect of certain drugs, various conditions associated with gas distention of the intestine and some of the possible physiologic mechanisms involved in these disorders.

Physiology

In spite of much study over many years, much

From the Department of Radiology of the College of Physicians and Surgeons of Columbia University, and the Radiological Service of the Presbyterian Hospital, New York.

The Carman Lecture delivered at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 26, 1952.

remains to be learned about the basic physiology of the small intestine. However, certain generally accepted facts are of importance in understanding some disorders of the intestine. A more extensive discussion of small intestine physiology applicable to the radiologic examination is available elsewhere.^{6,7}

The propulsive movements of the small intestine are composed of contractions of both longitudinal and circular muscle, preceded and followed by relaxation. These movements become disorderly and ineffective in experimental animals when the wall of the intestine is cocainized, and are regarded as reflexes, co-ordinated and controlled through the intramural nervous system. It follows, therefore, that to be normal and effective these movements require proper function of the nervous apparatus in the wall. Bayliss and Starling⁸ showed that the first evidence of fatigue of the muscle in the dog's intestine was failure of the wall to relax ahead of a contraction. It has also been shown that these contractions are associated with electrical discharges (Puestow,¹⁶ Smith¹⁹).

The mucosa of the small intestine, like that of the stomach, by virtue of the muscularis mucosae moves independently of the tunica muscularis. The muscularis mucosae forms and changes the mucosal folds which give the characteristic feathery pattern of the small intestine.

The intestine is innervated by the parasympathetic and the sympathetic divisions of the autonomic nervous system. The fibers of both divisions, along with blood vessels, pass between the two layers of the mesentery of the intestine where they are vulnerable to certain diseases. The intramural nervous system is composed of the myenteric (Auerbach's) plexus and the submucosal (Meissner's) plexus. Both contain ganglion cells and pre- and post-ganglionic fibers of the parasympathetic, and also post-ganglionic fibers of the sympathetic. Both also contain fibers not related to either division but which connect

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one short segment of intestine with another; presumably the reflexes which control the propulsive movements operate through these intersegmental fibers.

Stimulation of the vagus (parasympathetic) in animals or giving parasympathomimetic drugs increases tonus and peristalsis in the small intestine. Stimulation of the splanchnics or giving sympathomimetic drugs relaxes the intestine and diminishes peristalsis. Some of the reactions observed in the human intestine, however, suggest that the nervous control is not as simple as this sounds.

Evidence has been presented that stimulation of the parasympathetic produces acetylcholine, and that the injection of acetylcholine causes effects similar to parasympathetic stimulation. It has also been shown that sympathetic stimulation produces a substance similar to adrenalin in its effects. These two substances became known as chemical mediators.

The production of acetylcholine by an enzyme called "choline acetylase" (Nachmansohn and Machado¹⁵) requires among other things the correct concentration of potassium ions and the presence of a thiamin compound. Insufficiency of either of these or of other ingredients would interfere with the production of acetylcholine and, therefore, with the flow of nerve currents and with their effects on muscle cells.

Acetylcholine is inactivated very rapidly by a specific enzyme, "acetylcholine esterase," which is present only in nerve tissue. This enzyme is inhibited or destroyed by a number of substances including prostigmine. The administration of one of these inhibitors has an effect similar to stimulation of the parasympathetic system because it intensifies and prolongs the effect of any acetylcholine which happens to be present. However, an inhibitor such as prostigmine will have little or no effect if acetylcholine is reduced in amount or absent. It is generally agreed that acetylcholine is necessary for the passage of the nerve impulse along the nerve fiber and across the synapse and that it must be rapidly destroyed to permit the passage of the next impulse.³

The mechanism by which adrenalin produced by the sympathetic nerves counteracts the effect of the parasympathetic is apparently not known, but it acts in some respects like an inhibitor of acetylcholine.

X-Ray Examination of the Small Intestine

Examination of the small intestine by x-ray methods gives information, (1) about the transit time from the ingestion of the opaque material to its entrance into the cecum; (2) about the width of the lumen as a manifestation of tonus; and (3) about other less important manifestations of the motor function. The transit time varies to a degree with the character of the barium suspension. With barium in normal saline the transit time varies in apparently normal individuals from one to four hours. The width of the barium shadow varies from 2.5 to 3.0 cm. in the jejunum to 2.0 to 2.5 cm. in the ileum. Excessively rapid transit time and a narrow lumen can be regarded as a manifestation of excessive parasympathetic influence.

"Normal" is defined in the dictionary as average, and "abnormal" would, therefore, be defined as a deviation from the average. But in medicine the deviation must be of sufficient degree to be of clinical significance. The borderline between normal and abnormal is not often sharp and distinct.

Disorders Consistent with Parasympathetic Overactivity

The influence of emotional states on the gastrointestinal tract is well known. The effect may be diarrhea or pain or both.

Psychosomatic diarrhea in a number of cases has been associated with a very rapid transit time. Using a barium-saline suspension the opaque material reached the cecum in approximately fifteen minutes in some of these patients. One young woman was having up to fifteen watery movements a day at the time of admission. This patient's diarrhea quickly stopped under psychotherapy, but the rapid transit time in the small intestine persisted. In these cases the colon is also hypermotile, which does not allow sufficient time for the water in the contents of the small intestine to be absorbed in the large intestine.

A woman, aged seventy, was admitted in 1931 because of attacks of abdominal pain which began thirty-five years previously after desertion by her husband, leaving her five young children to support. The small intestine study disclosed extreme hypertonicity of the lower jejunum and proximal ileum (Fig. 1). Her symptoms were temporarily relieved by atropine, a parasympathetic inhibitor. Extensive clinical study failed to disclose an organic reason for the attacks of pain which she was still having in 1949 at the age

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eighty-eight. The clinical picture and the abnormal intestinal physiology shown by x-ray examination in 1931 and again in 1949 can be best explained as excessive parasympathetic influence of psychogenic origin.

disease, where it is probably the mechanism producing the abdominal pain of which celiac children not infrequently complain. Figure 2 shows an

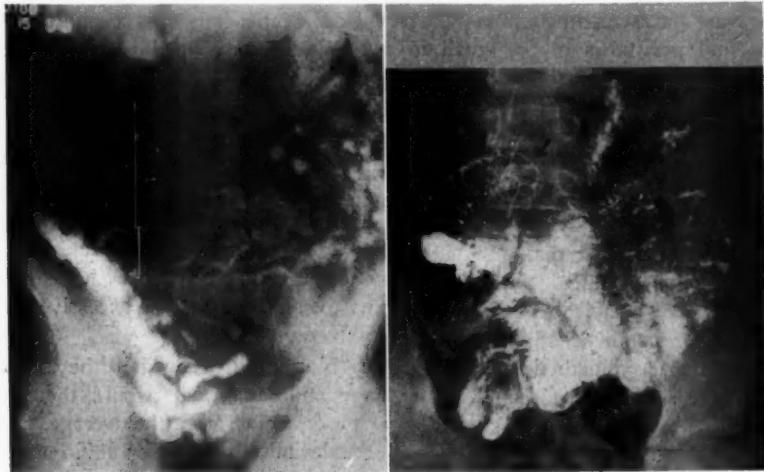


Fig. 1. (left) Hypertonicity of the small intestine associated with attacks of abdominal pain of psychosomatic origin.

Fig. 2. (right) Functional Intussusception. An eleven-year-old boy (Unit No. 877251) came to the Babies Hospital because of attacks of abdominal pain which began following the death of his father five years previously. A small intestine study disclosed at least two temporary intussusceptions, one of which is reproduced above. Careful clinical study led to the conclusion that his symptoms were of psychosomatic origin and that his mother needed psychiatric treatment even more than he did. After a congenial stepfather joined the family, the attacks of pain recurred less and less frequently and finally ceased. A second roentgen study about six months after the first showed nothing abnormal. (Courtesy of Dr. John Caffey.)

Functional intussusception, that is, intussusception without organic disease of the wall, was produced in monkeys²² by stimulation or extirpation of the cortex of the premotor area and was associated with overactivity of the intestine. The injection of parasympathetic stimulants in cats caused "contraction rings" in the small intestine, which either remained stationary or moved along and sometimes occluded the lumen.²⁰ Kuntz¹¹ states that a failure of the mechanism co-ordinating contraction and relaxation is apparently the initiating factor in the intussusceptions of infancy. Falor⁶ and Keith¹⁰ saw several intussusceptions at laparotomy in soldiers wounded in battle in Western Germany with no direct injury to the intestines themselves.

Teitlebaum and Arenson²¹ showed that recurrent, self-reducing intussusceptions in the small intestine of children can be demonstrated by x-ray methods. We have seen this in adults and also in a number of young children with celiac

example of functional intussusception of psychosomatic origin in a child.

Kuntz¹¹ regards allergic reactions as functional disturbances which involve primarily tonic changes in the musculature of viscera. These reactions are to be attributed to deviations from the normal autonomic balance, produced by "heightened parasympathetic or cholinergic reactivity."

Allergic reactions in the gastrointestinal tract responsible for symptoms are uncommon and are usually difficult to detect. We have seen a transit time of one-half hour or less and hypertonicity, particularly of the lower half of the small intestine, in patients whose symptoms were relieved by the elimination of some food, for example milk or eggs, from the diet. However, allergic phenomena manifest many vagaries. A rapid transit time and hypertonicity of the intestine are merely evidences of parasympathetic overactivity which in any given instance might be the background for allergic responses, and

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therefore do not justify a diagnosis. The examination of the small intestine is done with opaque material from which possible allergens are ex-

with involvement of the rectum. It has long been known that rectal irritation produces stimulation of the sympathetic. In these cases, there-



Fig. 3. Parasympathetic inhibition by banthine in a man twenty-three years old with a history of allergy. (A) The half-hour film, January 14, 1948, shows the head of the barium column in the midtransverse colon. The stomach was empty in one hour. At a similar examination on February 2, 1950, the barium entered the cecum and the stomach was empty in one and one-half hours. (B) On February 14, 1950, the patient received 100 mg. of banthine by mouth. This film, five and one-half hours after the ingestion of barium, shows a large amount of opaque material remaining in the stomach and the head of the column in the proximal part of the jejunum. The barium did not begin to enter the cecum until about nine and one-half hours. This illustrates the retarding effect on gastrointestinal movements of the parasympathetic inhibitor.

cluded. In the presence of an allergen, transit time may be slowed and abnormal segmentation of the barium shadows may appear.

Parasympathetic Inhibition

Physiologists have long known that atropine and certain other drugs prevent or reduce the effect of parasympathetic stimulation and of parasympathomimetic drugs. More recently another drug of this type called banthine has been put on the market and has been used largely to reduce gastric secretion, which is stimulated by the vagus. Its effect has been shown to be more prolonged than that of atropine.

Banthine also has a definite effect on the motor function of the small intestine. As shown in Figure 3, it produces hypotonicity and considerable slowing of the transit time. It has been useful in some patients with symptoms and signs consistent with excessive parasympathetic effect. In two of our cases it produced mild paralytic ileus. Both of these patients had ulcerative colitis

fore, in addition to this abnormal sympathetic stimulation, the banthine produced an inhibition of the counteracting parasympathetic influence. In fact, one of these patients found that he could control his abdominal distention by reducing the dose of banthine.¹²

Parasympathomimetic Drugs

The effects of parasympathetic action may be intensified and prolonged by any drug which inhibits choline esterase and thus prevents the destruction of acetylcholine (e.g. prostigmine, eserine, etc.), or by the use of an acetylcholine derivative (e.g. mecholyl, urecholine, etc.). These drugs are useful in the investigation of the motor phenomena of the small intestine.

Occasionally patients are encountered who have abdominal pain or distention, with a slow transit time. The symptoms in a number of these have been relieved by parasympathomimetic drugs. We have found that urecholine can be administered by mouth in doses which have a definitely stimulating

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effect upon a sluggish stomach and intestine without producing unpleasant side effects and which are followed by relief of symptoms.

Ingelfinger and Moss⁹ made studies of the motor activity of the intestine by means of a balloon in two cases of sprue. They found evidence of low tonus and sluggish contractions. Injection of prostigmine produced slight or no response but a prompt strong response followed the injection of mecholyl. They concluded that in these cases the intramural nervous apparatus of the intestine was unable to elaborate active acetylcholine.

May and McCreary¹⁴ showed that the injection of mecholyl in children with celiac disease, in which disordered motor function of the intestine occurs, was followed by an increase in intestinal movements and in the absorption of glucose.

The observations of Ingelfinger and Moss were reproduced in a sprue patient at the Presbyterian Hospital, using barium instead of a balloon.⁷

In one instance, distention suggesting a paralytic ileus appeared about eight days after amputation of the breast for carcinoma in a woman aged seventy-five. No cause for the persistent distention could be found. Prostigmine produced no response, suggesting a lack of acetylcholine. Administration of urecholine, however, was followed by prompt disappearance of the distention and uneventful recovery.

These observations indicate that under certain conditions insufficient acetylcholine is produced in the intestinal wall for reasons which are not clear. Because acetylcholine is necessary for the transmission of nerve impulses, the result of this lack would be manifested along the axone as interference with reflexes as well as at the effector cell. Could the apparent need for more parasympathetic influence in these individuals be analogous to the physiologic disorder of myasthenia gravis in skeletal muscles?

Sympathetic Overactivity and Intestinal Distention

The sympathetic may predominate because of: (1) overactivity of the sympathetic itself; or (2) insufficiency of the parasympathetic.

Overactivity or predominance of the sympathetic division of the autonomic nervous system theoretically should have effects similar to those of a parasympathetic inhibitor. General peritonitis is frequently associated with paralytic ileus.

Arai¹ showed in cats that experimental peritonitis resulted in slowing movements of the small intestine but this effect would not result if the splanchnics had been previously sectioned or if choline was injected. Arai concluded that the effect of peritonitis on the intestine was the result of overstimulation of the sympathetic. Considerable experimental evidence is available which indicates that epinephrine inhibits the action of acetylcholine, analogous to the effect of atropine.

Volk, at the Presbyterian Hospital, found no electrical activity in the intestine of a patient with paralytic ileus caused by an appendiceal abscess. As the patient improved, electrical activity was recorded before intestinal movements and before audible evidence of peristalsis could be detected.

Extreme distention of the intestine occurred in a strong 18-year-old boy who suddenly developed severe pain in the back and muscle spasm from what was later shown to be a herniated lumbar intervertebral disc. This distention disappeared quickly when the pain was relieved but reappeared on two later occasions when the pain recurred. In this case, the distention amounted to a paralytic ileus, was associated with distention of the bladder, and can be explained on the basis of sympathetic stimulation resulting from the pain and muscle spasm. Similar phenomena in a mild form have been associated with lumbar myositis, ureteral colic, et cetera. Unfortunately a satisfactory sympathetic inhibitor, like banthine for the parasympathetic, is not available, so that this physiologic hypothesis cannot be tested directly.

Intestinal Distention in Conditions with Insufficient Production of Acetylcholine

Banthine, a parasympathetic inhibitor, either depresses the production of, or reduces the effect of, acetylcholine. As mentioned above, this drug can cause gas distention of the intestine, presumably because the depression of the parasympathetic permits the sympathetic to become predominate. Distention may occur by this mechanism in any condition in which the production of acetylcholine is insufficient.

Administration of excessive amounts of intravenous fluid causes hypoproteinemia with edema and gas distention of the intestine. Under these conditions, this type of paralytic ileus may occur after operation or may complicate mechanical ileus. Edema of the lungs, with or without periph-

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eral edema, may develop. Intestinal distention occurred in a burn case receiving large amounts of intravenous saline. No response to prostigmine is obtained in such cases, which suggests that acetylcholine is not being produced in sufficient quantity to cause an effect on the muscle or else that the muscle becomes incapable of responding to acetylcholine when the inhibitor of acetylcholine esterase is given. The distention disappears when the excessive fluid intake is discontinued and the blood protein returns to normal.

Edema fluid in the intestine collects in the submucosa. Because the submucosa extends into the mucosal folds (valvulae conniventes), the fluid widens these folds (Fig. 4). This widening of the folds in the presence of edema can often be detected in the shadows of gas-distended loops of jejunum. These mucosal folds appear as fine lines running across the gas shadows; as edema develops these cross striations become two to four times the normal width, may become indistinct and even disappear.

A low blood potassium produces the same effect even in the presence of normal blood protein. A loss of potassium occurs after operations and is aggravated by excessive administration of intravenous saline. According to Randall and co-workers,¹⁷ symptoms of hypopotassemia usually appear from four to nine days after the operation, drowsiness, languor, "chronic ileus," scanty urine and edema. The first signs appear when the potassium level descends to 3.5 meq./L (normal 4 - 5 meq./L), and at 2.6 meq./L or less the symptoms become severe. This distention of the intestine is also not relieved by prostigmine, suggesting that the amount of acetylcholine available is insufficient to affect the muscle. The proper concentration of K ions is necessary for the production of acetylcholine and hence for the transmission of nerve impulses. Winter, Hoff and Dso²⁸ put rats into potassium deficiency and found reduced tonus and rhythmicity of the whole digestive tract, but particularly of the stomach and small intestine.

The amount of potassium in the blood serum may not give a correct picture of the electrolyte balance. The level in the blood may be normal in the presence of an intracellular deficit or may be low when potassium ions are rapidly leaving the blood to go into cells in which a deficit has occurred.

According to experimental evidence¹⁸ potassium

accelerates the production or the release of acetylcholine, which is counteracted by calcium and magnesium. Movement of potassium ions

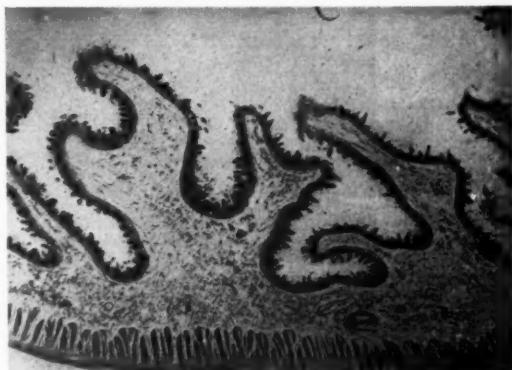


Fig. 4. Edema of the intestine due to hypoproteinemia in subacute yellow atrophy of the liver. The total blood protein was 5.0, albumin 3.1. The fluid is collected in the submucosa, not within the mucous membrane, and has produced a widening of some of the folds. This widening of the folds can sometimes be detected on films of the gas-distended intestine. The separation of the bundles of circular muscle is the result of artefact, not of edema. (Courtesy of Dr. Edith Sproul.)

plays a part in the transmission of nerve impulses. Possibly these mechanisms are disturbed in the presence of a potassium deficit. The rapidity of recovery following the administration of potassium suggests that this disorder of either nerve or muscle function is easily reversed.

Gas Distention with Disease of the Intestinal Wall

It seems advisable to point out that certain organic diseases of the wall of the intestine or of the mesentery may be associated with gas distention and that this may be differentiated with difficulty from gas distention of functional origin. Three organic diseases are worthy of mention in particular.

Scleroderma may involve the digestive tract. The esophagus is the most frequent site. However, Hale and Schatzki⁸ found dilatation of the small intestine with a slow transit time in four of twenty-two patients with scleroderma. In one case prostigmine and in another mecholyl, a derivative of acetylcholine, failed to produce an effect. The lack of response to mecholyl is particularly significant and indicates that the intestinal wall is incapable of responding to acetylcholine and therefore to parasympathetic stimulation.

Amyloidosis of the intestine may give the pic-

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ture of ileus and may result in operation for intestinal obstruction.¹⁸

Dr. R. A. Powers, Palo Alto, California, sent

A recent patient at the Presbyterian Hospital had persistent gas distention for several weeks and a very slow transit time, with no



Fig. 5. Slow movement of barium in amyloidosis of the intestine. (A.) One hour after taking barium. The proximal loops of jejunum are filled and show wide mucosal folds. (B.) At eight hours the head of the barium column is in the middle of the jejunum. The thickness of the wall of the intestine is well shown on this film. (C.) At twenty-four hours a little barium is distributed through the ileum, but most of it still remains in the jejunum. (D.) At forty-eight hours most of the barium remains in the jejunum and ileum. Very slow movement of intestinal contents does not necessarily mean obstruction but, as in this case, may result from inability of the intestine to contract. The patient was a man aged forty-two (Unit No. 048643) with albuminuria for ten years, mild neurological symptoms two years, and abdominal symptoms only about four months. Amyloidosis was shown by biopsy of the gum and two months later at autopsy.

me films and pathologic material on a patient in whom the symptoms of mechanical ileus were present. Microscopic examination of the wall of the intestine showed amyloid deposits in the intramural nerve ganglia as well as replacing muscle fibers.

response to prostigmine or to urecholine (Fig 5). Lack of response to this derivative of acetylcholine suggested that possibly the muscle was unable to react because of disease of the intestinal wall. For this reason, amyloidosis was suggested as one possible explanation, and two

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months later at autopsy the intestinal wall was found to be extensively involved by amyloid. This case illustrates the importance of approaching the problem of diagnosis of intestinal disorders from a physiologic standpoint and the value of tests with physiologic drugs in the search for explanations of these disorders.

Organic disease of the mesentery may cause gas distention and very slow movement of the intestine. In one case reported by me tremendous dilatation of the ileum was associated with and apparently caused by carcinomatous infiltration of the mesentery from *linitis plastica* carcinoma of the stomach demonstrated at operation.⁷ Several months later the intestine on x-ray examination appeared normal in width. This patient died elsewhere about nine months later. A hypothetical explanation can be offered on the basis of denervation of the intestine by the carcinomatous infiltration of the mesentery and the resulting increased sensitivity to adrenalin of the intestinal musculature which would produce dilatation. This sensitivity has been shown in animal experiments to decrease with the passage of time. The interesting phenomena of denervation are described at length by Cannon and Rosenblueth⁴ and by Youmans.²⁴

Other diseases of the mesentery may cause moderate dilatation of the intestine with little or no gas distention, e.g. sclerosing mesenteritis, and regional enteritis with fibrosis of the mesentery.⁶

Summary

Familiarity with certain aspects of the motor physiology is a necessary approach to an understanding of some of the disorders of the small intestine encountered in x-ray examinations. Neuromuscular physiology and the chemical mediator theory are particularly important.

Excessive influence of the parasympathetic based on emotional reactions can produce rapid passage of intestinal contents through both small and large intestines with diarrhea, hypertonicity, functional intussusception and can apparently also provide the background for allergic reactions.

Parasympathetic inhibition with slowing of intestinal movement and reduction of tonus can be produced by parasympathetic inhibitors, particularly by a new drug "banthine." Too much parasympathetic inhibition may result in gas

distention, a type of paralytic ileus. Evidence has been presented that adrenaline and therefore sympathetic stimulation prevents the action of acetylcholine on the muscle.

Parasympathomimetic action can be produced by inhibiting acetylcholine esterase and preventing the destruction of acetylcholine, provided sufficient acetylcholine is present. Injection of an acetylcholine esterase inhibitor may be used as a rough test to indicate whether acetylcholine is present in approximately normal amounts. In some patients administration of an acetylcholine derivative is necessary to get a parasympathomimetic effect.

Gas distention of the intestine may result from a number of causes, which apparently inhibit movement by depressing the effect of the parasympathetic. This has been seen (1) with severe pain in the back and with acute peritonitis, apparently through the mechanism of excessive stimulation of the sympathetic; (2) with hypoproteinemia; (3) with hypototassemia; (4) with an apparent lack of acetylcholine in the intestinal wall of unknown origin and relieved by giving urecholine.

Gas distention is also seen with certain organic diseases of the intestine, (1) scleroderma, (2) amyloidosis, (3) carcinomatous infiltration and probably other disease of the mesentery.

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INTRA-ARTICULAR USE OF HYDROCORTISONE IN RHEUMATIC DISEASES

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ADQUATE evidence is available that cortisone exerts a definite anti-inflammatory action on many tissues in their response to physical trauma, chemical irritation, infection, and hypersensitivity.¹ This non-specific ability to suppress the signs of inflammation is also shared by the closely related compound hydrocortisone. Corticotropin, which stimulates the adrenal cortex to produce these and other compounds, exerts a similar effect. In some instances, as in certain bacterial and viral diseases, this repression of the inflammatory response can be harmful in that it prevents the development or maintenance of a natural barrier to the spread of infection. In many other instances, however, especially in the group of disorders designated "collagen diseases," and in various allergic phenomena, which are associated with sterile inflammation, these drugs have a beneficial and at times life-saving value.

In addition to its effectiveness by systemic administration, the local application of cortisone has demonstrated an anti-inflammatory effect in various diseases of the eye² and the skin.² Hollander et al¹ extended the use of cortisone to intra-articular injection in patients with arthritic diseases. They found only a mild local suppressive action from cortisone, but hydrocortisone produced a very marked local anti-inflammatory effect. Their patients with osteoarthritis received benefit for an average of three weeks and patients with rheumatoid arthritis received benefit for an average of about eight days following one injection of 25 mg. hydrocortisone acetate.

The purpose of this report is to present in some detail the results of the local use of hydrocortisone acetate in a group of arthritic patients in order to define more clearly the place of this new agent in the therapeutic armamentarium of the medical practitioner.

Method of Study

Fifty-seven patients were given a total of ninety-two intra-articular injections of which seventy-six were hydrocortisone acetate and sixteen were cortisone acetate. Twenty-eight patients

had rheumatoid arthritis, twenty-four patients had osteoarthritis, three patients had periarthritis of the shoulder, and one each had chronic gouty arthritis and staphylococcal septic arthritis. The greatest number of injections were into the knee joint; next most frequent was the hip joint; and there were two elbow and one wrist injections. All injections were performed as out-patient clinic or office procedures. Initially, procaine was used for local anesthesia, but in a short time it was felt that most injections could be done without this preliminary step, especially if a 22-gauge needle was used. It is the author's impression that injection of the knee joint from the lateral direction is less painful than medial injection.

The dosage used in the majority of instances was 37.5 or 50 mg. of hydrocortisone acetate suspended in a saline solution at a concentration of 25 mg. per cc.* A few injections of as high as 87.5 mg. were given but there appeared to be no essential difference in the degree of relief or its duration with these various doses. In several of the earlier rheumatoid arthritic patients who were given just 25 mg. of hydrocortisone acetate, it was the impression that the duration of benefit was two to three days shorter than when the larger dosage was given, although in a few instances this difference was not observed.

The dosage of cortisone acetate* was 100 mg. in all instances except one, when 50 mg. was given to a patient who previously had experienced a moderate flare in her knee joint for twelve hours after injection of 100 mg. This injection also produced a flare which, however, lasted only six hours. Each flare was immediately followed by marked local improvement. This transient and apparent irritative action of the cortisone acetate was observed in one other patient.

In patients with rheumatoid arthritis the objective criteria such as joint swelling, tenderness and increased range of motion, following the intra-articular injection of these compounds were so obvious that it was felt that there was little

*Supplied through the courtesy of Merck and Company.

From the Department of Medicine, University of Minnesota Medical School, Minneapolis, Minnesota.

HYDROCORTISONE IN RHEUMATIC DISEASES—BILKA

TABLE I. RESULTS IN TWENTY-THREE PATIENTS WITH RHEUMATOID ARTHRITIS TREATED WITH INTRA-ARTICULAR HYDROCORTISONE ACETATE.

Grade of relief.	No. patients.	Average Duration of relief in days.
0	1	0
1 (10-25%)	1	4
2 (25-50%)	4	8-12
3 (50-95%)	16	10-21
4 (essentially complete relief)	1	28

need for control placebo injections. Nevertheless, saline was injected in two patients who had obtained definite improvement from hydrocortisone, one of whom also obtained benefit from cortisone, and in neither instance was any subjective or objective change noticed. Also, with few exceptions, repeated injections of the same steroid in the same patient produced strikingly similar responses. In osteoarthritis, however, a very different situation pertains. Evaluation of these patients rests almost entirely on subjective phenomena. By very careful inquiry as to the distance the patient can walk without pain, the time it takes to limber up after a rest period, the disappearance of a limp, etc., these subjective data can be rendered quite valuable, but the marked spontaneous variation in symptoms which these patients experience is familiar to patient and physician alike. Therefore, in four patients with osteoarthritis of the hip joints who had obtained some benefit from hydrocortisone, control injections of saline were made in three and procaine was used in the fourth. In all instances, a comparable degree of improvement followed the control injection. In one patient, an objective increase in hip flexion by 15 degrees followed each procedure. One sixty-six-year-old man with severe osteoarthritis of the knees (including the presence of multiple loose bodies) obtained no relief following an intra-articular injection of 1 cc. of 1% procaine. On five other occasions he has obtained marked relief lasting two to four weeks following injections of cortisone or hydrocortisone. Two patients with mild chronic osteoarthritis of both knees received 1 cc. of saline in one knee and 50 mg. hydrocortisone in the other knee: one patient reported a mild improvement, estimated at 5 to 10%, in each knee; the other reported no improvement in either knee. It is apparent, therefore, that the interpretation of uncontrolled observations, especially in patients with chronic osteoarthritis treated with this or any agent is difficult and hazardous.

TABLE II. RESULTS IN SEVEN PATIENTS WITH RHEUMATOID ARTHRITIS TREATED WITH INTRA-ARTICULAR CORTISONE ACETATE.

Grade of relief.	No. patients.	Average duration of relief in days
0	2	0
1	0	0
2	2	7
3	2	7
4	1	28 plus

Rheumatoid Arthritis

Twenty-three patients with rheumatoid arthritis were given intra-articular injections of hydrocortisone acetate into their knee joints. The results are summarized in Table I.

In one patient no effect was noticed and in another only a minimal improvement was recorded. All other patients noticed very appreciable subjective and objective improvement. The improvement was limited to the injected joint and in several instances coincidental flares occurred in other joints. Some patients noticed improvement within four to six hours, most patients were aware of improvement within twelve hours after the injection, and all noticed it by twenty-four hours. Maximal subjective improvement occurred by the second day, and this was usually the time that the knee joint swelling and tenderness was at a minimum. This state then persisted for seven to twelve days, when gradual return of swelling and pain occurred over the next three to seven days. In a few patients, the return of symptoms was more rapid, and in several patients, there was some persistent improvement for several weeks. No significant declines in sedimentation rate were noticed. No adverse local or systemic reactions were observed.

In addition to the knee joint injections, two patients were given 50 mg. hydrocortisone acetate into involved elbow joints. A grade 3 improvement occurred in each case which lasted over three weeks. Some persistent benefit was present one month and one and a half months later respectively. Another patient was given 25 mg. hydrocortisone acetate into the medial aspect of a swollen right wrist. A grade 2 improvement, localized to just the medial half of the wrist, occurred, and lasted for one week.

Seven patients with rheumatoid arthritis were given a total of fourteen intra-articular injections of cortisone acetate into their knee joints. The results are summarized in Table II.

HYDROCORTISONE IN RHEUMATIC DISEASES—BILKA

Two patients, on a total of four occasions, developed increased pain lasting six to twelve hours after the injections, but each such episode was then followed by a grade 3 improvement lasting four to nine days. One patient obtained a complete remission of knee joint symptoms following a single injection of 100 mg. of cortisone acetate. There then developed rather rapid improvement in the patients other joints. This coincidental spontaneous remission was still in evidence nine months later.

It is apparent that while cortisone acetate has a definite local anti-inflammatory effect, its action is less reliable and only about half that of hydrocortisone acetate.

The practical value of this procedure in rheumatoid arthritis is subject to serious limitations. In most patients, the disease process is polyarticular, and rather little is to be gained from temporary improvement in just one or two joints. However, there are definite instances of marked value. A case in point is a young nurse whose most serious involvement is the right knee, and by injecting this joint every third week she has been able to continue work. In several instances the local injection of hydrocortisone acetate seems to have facilitated the employment of physical therapy and the more rapid reduction of knee flexion contractures.

Knee joint synovial biopsies,⁶ before treatment, were performed in six patients. In three patients, repeat biopsies were performed on the fifth or seventh day after the intra-articular injection of hydrocortisone acetate. A slight decrease in the tissue reaction was thought to be evident in one patient but no change occurred in the other two. One of these patients was then continued on weekly intra-articular injections of 50 mg. hydrocortisone acetate despite the non-return of symptoms. A week after the third injection, or after an asymptomatic period of three weeks, the biopsy was repeated. The improvement in the histologic picture is evident from the comparative biopsies (Figs. 1, 2, 3). Peculiarly, the patient's knee joint improvement persisted for over one month following her fourth and last weekly injection, whereas on two previous occasions improvement lasted only ten to fourteen days. This raises the question as to the possibility of producing more marked, and perhaps longer enduring, improvement through the continuous suppression of the local tissue reaction for a month or more.

TABLE III. RESULTS IN EIGHT PATIENTS WITH OSTEOARTHRITIS OF THE HIPS TREATED WITH HYDROCORTISONE ACETATE.

Grade of relief	No. patients	Average duration of relief in days
0	3	0
1	2	3
2	1	10
3	1	21
4	1	28 plus

Recently Goldman, O'Hara and Baskett³ have reported the detection of crystals of cortisone and hydrocortisone some months after their injection into the normal skin of man.

Osteoarthritis

Twenty-four patients with osteoarthritis were given intra-articular injections of hydrocortisone acetate. One of these patients also was given cortisone acetate intra-articularly. Sixteen of the patients had osteoarthritis of the knees; eight had osteoarthritis of one or both hips. Knee joint biopsies were performed in two patients who seemed to have somewhat greater synovial reaction than is ordinarily seen in osteoarthritis. In each instance the histologic picture was consistent with that seen in osteoarthritis.

The results in the eight patients with hip involvement are summarized in Table III.

The one patient who obtained a complete remission of symptoms was a man, fifty-six years old, who twisted his left hip while bending over to inspect a roller in a paper mill. He developed immediate hip pain which recurred on any attempt to bend or to bear weight on the left hip. Physical examination showed slight limitation in flexion and abduction of the left hip, and x-ray examination showed slight narrowing of the hip joint space with minimal hypertrophic spurring. The patient had been disabled from work for four months. Twelve hours after the injection of 37.5 mg. hydrocortisone acetate into the left hip joint (checked by film while the patient was on the x-ray table), there was complete relief of symptoms and the patient returned to work in a few days. He continued to be without symptoms, and physical examination was normal, one month later. Three patients obtained no relief from the injection of hydrocortisone acetate. Of the remaining four patients who obtained some relief, all were subsequently given placebo injections. In each instance, the placebo injection duplicated the result of the steroid. It is apparent, therefore, that with the

HYDROCORTISONE IN RHEUMATIC DISEASES—BILKA

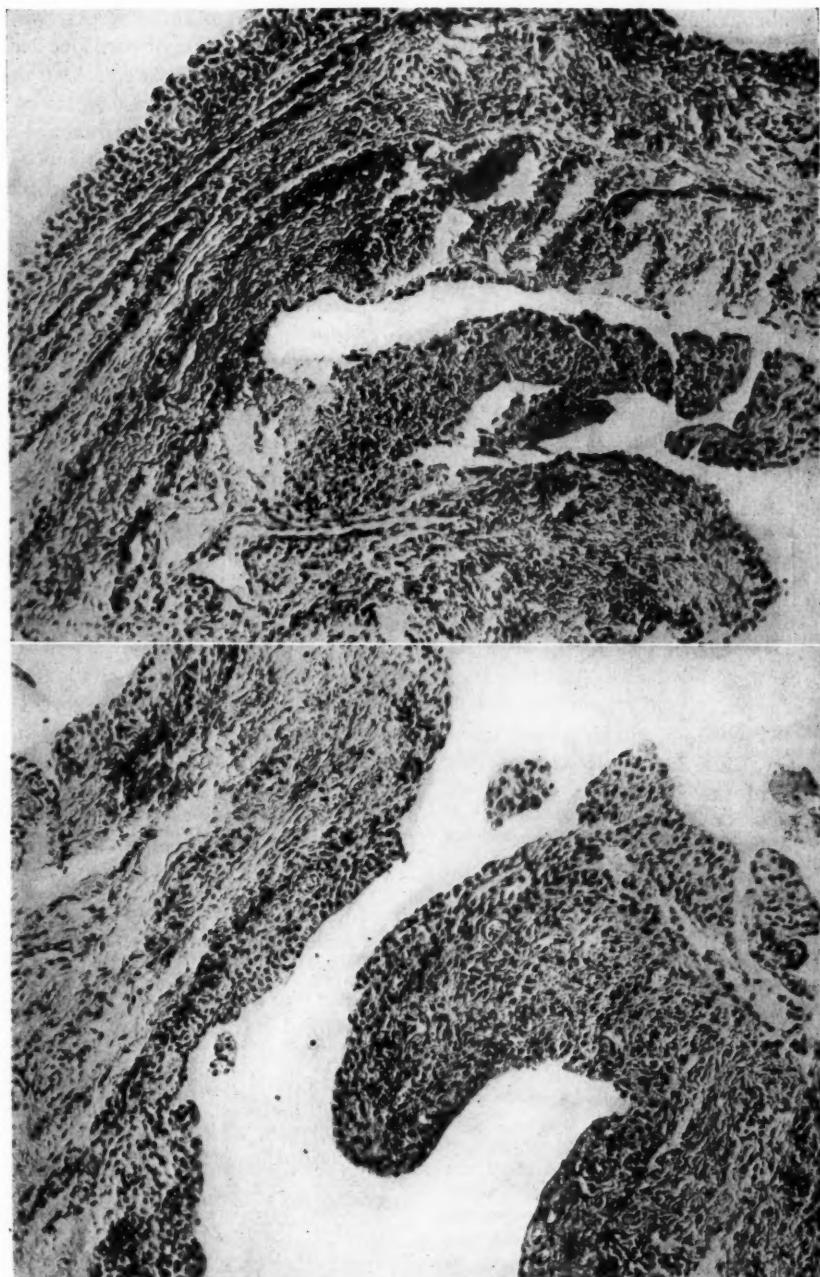


Fig. 1. Microscopic section (x 50) of synovium right knee before treatment.
Fig. 2. Synovium five days after intra-articular injection of 50 mg. hydrocortisone acetate showing no essential change.

HYDROCORTISONE IN RHEUMATIC DISEASES—BILKA

TABLE IV. RESULTS IN SIXTEEN PATIENTS WITH OSTEOARTHRITIS OF THE KNEES TREATED WITH HYDROCORTISONE ACETATE.

Grade of relief	No. patients	Average duration of relief in days
0	3	0
1	1	7
2	5	14
3	4	21 plus
4	4	28 plus

one exception of the patient with a traumatic arthritis superimposed on a minimal osteoarthritis of the hip, the beneficial effect of hydrocortisone acetate in chronic osteoarthritis of the hip joint is in doubt.

The results in sixteen patients with osteoarthritis of the knee joints are given in Table IV.

The total in Column 2 is 17 due to the fact that one patient had no benefit following the injection of 50 mg. hydrocortisone acetate into her left knee which was only mildly involved, while she experienced a grade 2 improvement following a similar injection into her right and more severely involved knee joint—although a previous injection of procaine into this same knee gave no relief. Of the eight patients who obtained a grade 3 or grade 4 improvement, all gave past histories of essentially asymptomatic or only mildly involved knee joints with more recent flares in knee pain as a result of excessive physical activity. A typical case history is as follows:

A male factory worker, sixty-seven years old, had had for the previous three years occasional episodes of mild aching in both knees, especially noticeable toward the end of his work days. One evening, following the shoveling of a 10-inch snowfall from his front walk, he experienced a marked increase of pain in the right knee. The next morning he went to work but after being on his feet for just one hour the pain had so increased that he had to be taken home. Physical examination that afternoon revealed moderate limitation in joint motion apparently due to muscle guarding, and slight medial joint tenderness. X-ray of the knee revealed extensive hypertrophic spurring and fairly marked medial narrowing of the joint space. The patient was placed at absolute bed-rest and the symptomatic use of heat, codeine, and aspirin were prescribed. On the fifth day, there was less pain at rest and passive motion of the knee was more free, but weight bearing still elicited severe pain. At this time 37.5 mg. hydrocortisone acetate was injected into the right knee joint. Ten hours later the patient was able to bear his full weight on the right knee without pain. The knee was normal on physical examination two days later. The patient returned to work on the third day and he has continued well except for the occasional return of the mild aches he had experienced in the past.

One of the patients who on two occasions obtained a grade 3 improvement from hydrocortisone lasting two to three weeks, was given an intra-articular injection of cortisone acetate. After a localized flare lasting twelve hours, he experienced a grade 2 relief which lasted ten days.

A striking fact emerged from the analysis of the data in the group of patients with osteoarthritis of the knee joints: the poor or minimal results were in those patients with a chronic and on the whole a relatively mild degree of disability, while the excellent results were, without exception, in patients who had acute or subacute flares superimposed on their chronic osteoarthritis. In most of these latter patients a definite traumatic event could be brought out from their histories, and the improvement usually was complete in patients who had no symptoms before their trauma, while those patients with chronic low grade symptoms usually were restored to their previous state of mild disability. This would appear to indicate that hydrocortisone acetate is of the greatest value in suppressing the acute inflammatory reactions of trauma rather than the minimal and gradual type of tissue reaction that is more characteristic of chronic osteoarthritis. The dramatic improvement reported in a few instances of acute traumatic joints in young individuals treated with hydrocortisone would appear to support this concept.⁵

Other Rheumatic Conditions

One patient with chronic gouty arthritis was given 37.5 mg. hydrocortisone acetate into the right knee joint. An improvement graded as 2 plus occurred within twelve hours and persisted for about two weeks when he began to experience improvement in the other knee and several additional involved joints as a result of the interim gout therapy. This generalized improvement has continued under the program of a low purine diet and salicylates.

One patient with septic arthritis of the knee, secondary to a severe staphylococcal cellulitis of the forearm, was treated with the intra-articular injection of hydrocortisone acetate. The injection was made during the convalescent period when there was no longer evidence of active knee joint infection, but while there was persistent severe pain which prohibited weight bearing and which interfered with the attempts of physical medicine to restore a normal range of motion. Within

HYDROCORTISONE IN RHEUMATIC DISEASES—BILKA

six hours after the injection of 50 mg. hydrocortisone acetate the knee was less painful and by twenty-four hours full weight bearing was pos-

moderate to marked local improvement in symptoms and objective findings in 90 per cent of patients which lasted from one to two weeks.



Fig. 3. Synovium, from the microscopic field showing the greatest cellular reaction, taken twenty-one days after starting weekly injections of 50 mg. hydrocortisone acetate.

sible. A grade 3 improvement which lasted for five days permitted the discharge of the patient from the hospital and the continuation of physical therapy as an out-patient. By ten days much of the knee pain returned but this was again relieved by a second injection of 50 mg. hydrocortisone.

Three patients with acute periarthritis or so-called "bursitis" of the shoulder were treated by the injection of 25, 30, and 37.5 mg. of hydrocortisone acetate respectively into the localized area of acute tenderness. One patient noticed about a 25 per cent improvement within twenty-four hours, and she then gradually recovered in two weeks. The other two patients received no help from the injection. One patient subsequently made a good response to x-ray treatment.

Summary and Conclusions

1. The injection of 37.5 to 50 mg. hydrocortisone acetate into the joints of twenty-three patients with rheumatoid arthritis produced a

2. Histologic study of the synovium in a small group of cases showed rather little comparative change in the local tissue reaction with the exception of one patient who was given weekly injections and who after three weeks showed definite evidence of microscopic "healing."

3. The injection of cortisone acetate in doses of 100 mg. into the joints of seven patients with rheumatoid arthritis produced an effect about half that of hydrocortisone. In addition, a temporary local irritation occurred in two patients.

4. In osteoarthritis of the hip joints there is much doubt as to the value of local injections of hydrocortisone. The importance of controlled studies is emphasized.

5. In osteoarthritis of the knees hydrocortisone acetate appears to be of little value in the average case of chronic, low grade activity. However, in patients who are experiencing acute or subacute flares in symptoms as a result of recent trauma, etc., the local injection of hydro-

(Continued on Page 968)

SEGMENTAL RESECTION IN THE TREATMENT OF INFLAMMATORY PULMONARY LESIONS

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IN 1939, Churchill and Belsey⁵ demonstrated and reported segmental resection in the treatment of inflammatory lesions in the lung. Many surgeons were reluctant to employ segmental resection in preference to lobectomy because of higher incidence of postoperative complications that occurred with segmental resection. Many of the residual segments functioned improperly due to kinking or interference with the bronchi, and also due to interference with the blood supply of the small residual segments. Important refinements in the technique of segmental resection have been made by Overholt,⁷ Claggett,⁶ Blades,¹ Ramsey⁸ and others, so that at the present time, great stress is laid upon the necessity for accurate, anatomical, intersegmental dissection of the segments. With present-day techniques, it is possible to completely excise the diseased segments with no distortion of the anatomy or impairment of the bronchial or blood supply to the adjacent segments. Improvements in the technique of operation, the wider range of antibiotic drugs available, increased knowledge of the intersegmental anatomy^{2,6} and the increased familiarity with this operation have all led to a reduction in the morbidity following this operation, so that at present segmental resection can be carried out with as few major complications as lobectomy. The incidence of minor complications still remains somewhat higher with segmental resection than with lobectomy.

Segmental resection has certain advantages over lobectomy. It provides a method by which the diseased tissue can be excised with minimal interference with pulmonary function. This factor becomes of great importance when operating on patients with poor or reduced pulmonary reserve. There are many occasions in which the diseased pulmonary segments are not confined to one lobe, but are scattered throughout several lobes of both lungs. In such cases, segmental resection offers the only possible surgical approach which will al-

low complete eradication of all the diseased tissue.

Bronchiectasis will often be distributed in characteristic patterns. Rather commonly one sees involvement of the basilar segments of both lower lobes; the lingula of the left upper lobe and the right middle lobe. The superior segments of the lower lobes usually are uninvolved and have undergone marked enlargement and hypertrophy at the expense of the contracted diseased segments (Fig. 1). Segmental resection here affords a method of excision of all diseased segments, with preservation of sufficient functioning pulmonary tissue to avoid severe respiratory crippling. It is essential that the bronchogram show all branches of the bronchial tree, as the surgeon cannot palpate the diseased segments at operation.

We have outlined a number of these small residual segments by attaching metal radio opaque markers to their margins during the operation. Postoperative chest x-rays demonstrate normal expansion. These segments obviously function very well as space-filers. This fact alone would justify preserving small segments in order to prevent overexpansion of the adjacent lobes and thus improve the pulmonary function. There is good indirect evidence obtained by differential bronchiospirometry that these residual segments function normally as efficient respiratory organs.

Surgeons have been slow to utilize segmental resection for known tuberculous lesions. There has been a reluctance to dissect near caseous tuberculous foci for fear of producing tuberculous empyema and spread of the disease. Experience has shown that this violation of tuberculous tissue has, to date at least, not been productive of demonstrable harmful effects.^{3,4} Segmental resection, combined with local excision, appears to be of great value in the eradication of multiple, scattered, bilateral, caseous, cavitary, tuberculous foci. (Figs. 2, 3 and 4).

Limited excision of tuberculous foci has been carried out in a number of patients who have

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residual caseous foci, in order to reduce the incidence of reactivation and spread that is known to occur in this group. (Figs. 5 and 6).



Fig. 1. Bronchogram of right lung showing Bronchiectatic basal segments with normal superior segment bronchi. Middle lobe bronchi are also involved. Note overexpansion of the superior segment of the right lower lobe.

Finally, a third group has been subjected to localized or segmental resection of residual tuberculous lesions in preference to thoracoplasty, since resectional therapy will be more saving of pulmonary function, with a somewhat greater incidence of sputum conversion.

A summary of eighty-four resections on the author's service from March, 1951, to February, 1952, at Glen Lake Sanatorium reveals that fifty-eight primarily segmental resections were done in fifty-one patients. Of this group of fifty-one patients, thirty-one had bilateral involvement. One patient died as a result of cardiac arrest, giving a patient mortality rate of 1.9 per cent, and a mortality rate per operation of 1.7 per cent. Of the fifty survivors, four (8 per cent), had severe complications, consisting of one contralateral spread, one broncho-pleural fistula (now closed), one residual cavity in a patient who also developed uremia with convulsions as an exacerbation of pre-existing severe nephritis, and one who has a questionable recurrence at the site of the previous local excision.

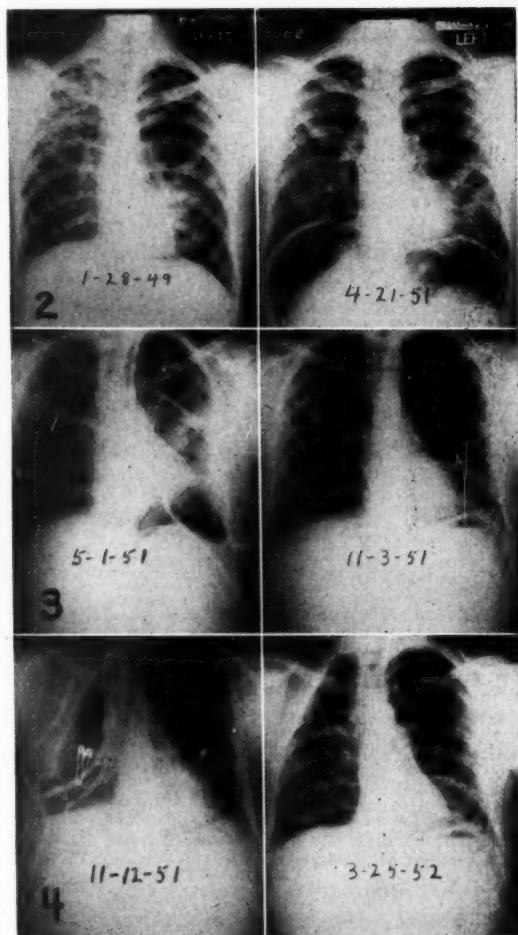


Fig. 2. L.G. (left) Admission film showing extensive bilateral tuberculosis with cavitation. (Right) Preoperative film twenty-seven months after admission. Had bedrest and pneumoperitoneum plus tibione.

Fig. 3. L.G. (left) Immediate postoperative x-ray. Excision of nodules in left lower lobe and segmental resection lingula of left upper lobe. (Right) Film six months after first resection. Vital capacity 3,200 cc. The left lung contributes 50 per cent of vital capacity and has better oxygen uptake than the right.

Fig. 4. L.G. (left) Immediate postoperative x-ray after right upper lobe lobectomy, segmental resection of portion of right middle lobe, and excision of nodules in right lower lobe. (Right) X-ray after bilateral resection. He has had five gastric cultures since operation, all negative for tubercle bacilli.

Seven patients had minor complications consisting of residual air pockets which persisted for varying lengths of time. One of these patients had a small thoracoplasty done ten days after the resection; the remainder were treated expectantly

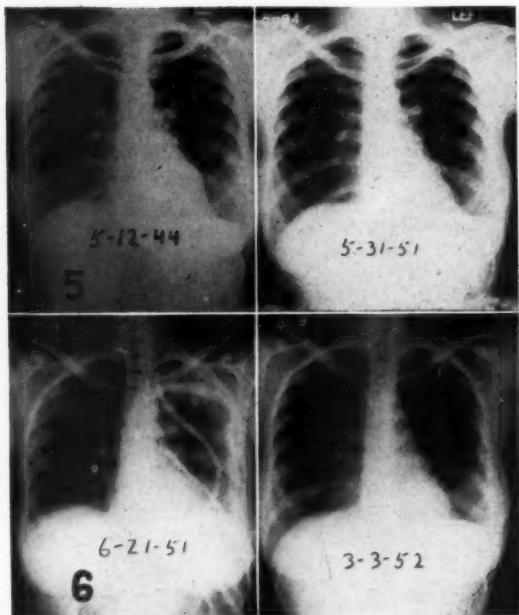


Fig. 5. P.H. (left) Note fibronodular disease in left upper lobe. This patient has had intermittently positive sputum with activity since 1941, despite prolonged sanatorium care. (Right) Preoperative film showing residual fibronodular disease in left upper lobe. Gastric cultures positive for acid-fast bacilli.

Fig. 6. P.H. (left) Immediate postoperative x-ray after resection of segment of left upper lobe. (Right) Late postoperative film. Six gastric cultures have all been negative for tubercle bacilli.

or by aspiration with eventual obliteration of the pleural space.

A number of factors are present which make interpretation of the postoperative sputum status difficult. The period of follow-up is too short;

many of the patients are awaiting surgery on the contralateral lung. Some have converted to negativity as a result of their medical management, especially with the use of streptomycin therapy prior to surgery, and are still on antibiotic therapy to control small residual foci.

Twenty-three patients have cultures running; one patient died. This leaves twenty-seven available for study at the present time. Of these twenty-seven, eighteen (66 per cent) have had negative sputum and gastric cultures; five (18 per cent) have had an occasional positive culture. Two (7.4 per cent) have positive cultures but are improved, and two (7.4 per cent) have positive cultures with x-ray evidence of active disease. These conversion rates compare favorably with the early studies of conversion rates following lobectomy.

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POSTDOCTORAL FELLOWSHIPS AVAILABLE

The National Foundation for Infantile Paralysis announces the availability of a limited number of additional postdoctoral fellowships to candidates whose interests are research and teaching in medicine and the related biological and physical sciences. The purpose of these National Foundation fellowships is to increase the number of professional workers qualified to give leadership in the solution of basic and clinical research problems of poliomyelitis and other crippling diseases.

The fellowships cover a period of from one to five years. Stipends to Fellows range from \$3,600-\$7,000 a year, with marital and dependency status considered in determining individual awards. Institutions which accept Fellows receive additional compensation for expenses incurred in relation to their training programs.

Eligibility requirements include United States citizen-

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Selection of candidates is made by a Fellowship Committee composed of leaders in the fields of research and professional education. The designation "Fellow of The National Foundation for Infantile Paralysis" will be given to successful candidates.

A total of 144 fellowship awards in these categories have been made by the National Foundation up to August 31, 1952.

Complete information concerning qualifications and applications may be obtained from: Division of Professional Education, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

AUREOMYCIN IN INFECTIONS OF THE URINARY TRACT

A Clinical and Bacteriologic Study

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and

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DURING the past five years the discovery and development of new antibiotic agents have been so rapid that a precise knowledge of their effectiveness and clinical applicability has sometimes failed to keep pace. Since 1946, when penicillin came into general use, streptomycin, aureomycin, chloramphenicol, terramycin, polymyxin and neomycin have swiftly appeared, each with its own special therapeutic value and unlimited prospects for the future.

One of the latest antibiotics, aureomycin, was first isolated by Duggar from the yellow pigment-producing mold *Streptomyces aureofaciens* in 1947 but was not described by him until 1948 when he reported his work before the New York Academy of Sciences.² His results from *in vitro* antibiotic studies suggested that aureomycin was effective against a multitude of organisms, some of which were pathogens of the urinary tract. By 1949, when our study began, little clinical evidence had been reported to corroborate these laboratory implications.

Purpose of Study

It was our desire to determine the sensitivity of a large variety of bacteria obtained from cultures of infected urine of patients, to treat as many of these patients as possible with aureomycin for a fixed time and to observe the clinical and bacteriologic results.

Methods and Materials

Examinations of the urine of 174 patients were made prior to treatment of infections of the urinary tract with aureomycin. A total of 187 separate cultures and sensitivity tests were performed before treatment, the larger number of

The aureomycin used in this study was supplied by Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

The laboratory work was carried out by the Section of Bacteriology.

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cultures representing mixed infections in some of the patients. Of the 174 patients only fifty were carefully enough controlled to be included in this study as far as clinical response was concerned. Patients excluded were those who could not take oral medication, those who were treated with another antibiotic in conjunction with aureomycin and those who were dismissed without a follow-up culture or Gram stain, or both.

The urine was collected in sterile containers and transported immediately to the Section of Bacteriology. On receipt in the laboratory approximately 0.1 cc. of the urine was placed on the surface of an eosin-methylene blue plate and a blood-agar plate and incubated over night. In some instances the organisms obtained by culture were held over until aureomycin therapy had been completed in order that their susceptibility to aureomycin could be compared with that of organisms isolated after completion of therapy. Tests of sensitivity to aureomycin *in vitro* were carried out on freshly prepared blood-agar plates in which aureomycin was incorporated. A uniform inoculum of an eight-hour culture was spread evenly over the surface of a series of blood-agar plates containing twofold dilutions of aureomycin. The plates were incubated at 37° C. for seventeen hours and the sensitivity recorded was the concentration of aureomycin which would inhibit completely the growth of the organisms.

The degree of sensitivity to aureomycin was graded according to the amount of the drug necessary to inhibit growth, in the following manner: highly sensitive—growth inhibited by 1.56 micrograms or less per cubic centimeter; moderately sensitive—growth inhibited by 3.12 micrograms per cubic centimeter, and resistant—growth not inhibited by 6.25 micrograms per cubic centimeter or more. In some instances the sensitivity of the organisms was checked against concentrations of aureomycin as high as 500 micrograms per cubic centimeter.

Dosage of aureomycin, both total and daily, varied with the organism cultured from the urine,

INFECTIONS OF THE URINARY TRACT—LONGLEY AND THOMPSON

TABLE I. ORGANISMS ISOLATED IN 187 CULTURES FROM 174 PATIENTS WITH INFECTION OF THE URINARY TRACT AND THE SENSITIVITY OF THESE ORGANISMS TO AUREOMYCIN IN VITRO

Organism	Total Cultures	Highly Sensitive	Moderately Sensitive	Resistant Number	Resistant Per cent
Escherichia coli	61	11	28	22	36
Aerobacter aerogenes	48	13	22	13	27
Proteus vulgaris	31	0	1	30	97
Micrococcus pyogenes	18	15	0	3	17
Pseudomonas aeruginosa	16	0	1	15	94
Streptococcus faecalis	12	11	1	0	0
Streptococcus viridans	1	0	1	0	0
Total	187	50	54	83	

its sensitivity, and the size of the patient; it was usually 1 gm. a day for four days. At first, post-therapy cultures were taken forty-eight hours after the administration of aureomycin had been stopped, in accordance with previous reports¹ that the lapse of approximately this much time is necessary to clear the urine of aureomycin. Later we discovered that in most instances the concentration of aureomycin in the urine had little effect if the cultures were made shortly after use of the drug was discontinued; dilution and instability of the drug no doubt contributed to these findings in cultures. Sensitivity was determined after treatment in a number of instances in which cultures were positive and the organism tested against higher concentrations of aureomycin.

Results and Comment

The variety of organisms isolated in our study and their sensitivity to aureomycin are indicated in Table I. Escherichia coli was the most common organism (33 per cent of the cases) and 64 per cent of these were sensitive *in vitro*. Aerobacter aerogenes was the second most common one (26 per cent of the cases) and 73 per cent were sensitive *in vitro*. Proteus vulgaris was found in 17 per cent of the series and all but one was considered resistant (97 per cent were resistant). Micrococcus pyogenes formed 10 per cent of the 187 cultures and 83 per cent were considered sensitive. Pseudomonas aeruginosa was present in 9 per cent of the cultures and all but one were resistant (94 per cent were resistant). Streptococcus faecalis was cultured eleven times (6 per cent of the cases) and all were sensitive. Streptococcus viridans was found on one occasion and it was sensitive.

TABLE II. ORGANISMS ISOLATED IN FIFTY-FOUR CULTURES FROM FIFTY PATIENTS WITH INFECTIONS OF THE URINARY TRACT AND THE PROPORTION NOT CONTROLLED BY TREATMENT WITH AUREOMYCIN

Organism	Total cultures	Not controlled bacteriologically Number	Not controlled per cent
Aerobacter aerogenes	23	1	4
Escherichia coli	16	3*	19
Streptococcus faecalis	5	0	0
Proteus vulgaris	3	2	67
Pseudomonas aeruginosa	4	3	75
Micrococcus pyogenes	3	1	33
Total	54	10	19

*Two of these were sensitive and 1 was resistant to aureomycin *in vitro*.

Proteus and Pseudomonas were resistant to aureomycin at high concentrations *in vitro*. In two cases Proteus was inhibited by 500 micrograms per cubic centimeter; Pseudomonas was inhibited by 100 micrograms per cubic centimeter in two cases and by 500 micrograms per cubic centimeter in one case.

From Table I it may be seen that 104, or 56 per cent, of the 187 organisms were sensitive to aureomycin *in vitro* and, if the Pseudomonas and Proteus groups are excluded, 73 per cent of the other bacteria were sensitive to this antibiotic *in vitro*.

Table II summarizes the clinical results. Escherichia coli and Aerobacter aerogenes occurred frequently enough to give significant results. In these groups treatment failed in 19 per cent and 4 per cent, respectively, as compared to *in vitro* resistance in 36 per cent and 27 per cent, respectively. As is indicated by comparison of Table I and Table II, *in vitro* tests in this series were somewhat misleading as to therapeutic results to be expected. The difference may mean that our standards for resistance to these organisms may have been too low when one considers the high urinary levels of aureomycin attainable clinically² and that a certain percentage of the organisms that did respond but were "resistant" *in vitro* may have been inhibited in the next few stronger dilutions of aureomycin in the laboratory sensitivity tests.

In some of the cases of urinary infection the original organism was removed by treatment with aureomycin but another organism, usually Proteus or Pseudomonas, grew out in the culture when use of the drug was stopped. These were cases

(Continued on Page 974)

THE HYPERTENSION PROBLEM

Recent Advances in Clinical Description and Management with Drugs

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ESSENTIAL hypertension has been recognized as a disease entity for over sixty years. During this period progress toward effective treatment has been painfully slow and the course of the disorder can only rarely be halted. It seems reasonable to believe that this situation will not always obtain and the profession should not fall by the wayside into the morass of therapeutic nihilism. On the other hand, it is high time a measure of reason was introduced into our outlook concerning the course of the untreated disease. In any case, progress toward an adequate description of the natural history of essential hypertension has, in recent years, been more impressive than progress in the treatment of the disorder.

We can, therefore, begin to cut this monster down to size. Since no effective depressor measure is, or is likely to become, free from inconvenience and possibly danger to the patient, it is clearly wrong to employ such agents unnecessarily. Likewise, it is fatuous to claim great success for therapeutic agents when they have been tested on patients who would do well even if left untreated. It all comes down, in the last analysis, to two questions: (1) What patients with essential hypertension should we treat? (2) What therapeutic method should we use in those patients who require treatment? In the latter connection, this presentation will deal only with some of the newer drugs, in view of the nature of our own experience and the limited time available.

Normal and Abnormal Blood Pressure

Every physician knows that many, and perhaps most, hypertensive patients go for many years without developing any of the dread sequelae of prolonged hypertension such as heart failure, cerebrovascular accidents, or uremia. He also knows that many of them are able to continue

These studies are being supported in part by a grant from the Minnesota Heart Association.

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at their daily work, particularly if they can be persuaded to maintain a firm and unruffled attitude toward their disease. This is not to say that cardiac failure and cerebrovascular disease due to essential hypertension are particularly uncommon, but, relative to the number of patients we usually consider to be hypertensive, they are indeed infrequent or at least surprisingly slow to make their appearance.

TABLE I. INCIDENCE IN PER CENT OF HYPERTENSION BY SEX AND AGE.

Condensed from Master, Dublin, and Marks (1).

Sex—Age	140/90	150/90	150/100	180/105
Men	16-19	13.1	9.2	4.0
	35-39	29.1	23.3	9.5
	60-64	60.3	48.5	36.9
Women	16-19	5.3	4.0	1.4
	35-39	20.8	16.4	6.1
	60-64	64.4	51.8	40.8

One may well wonder, therefore, about our criteria for differentiating between normal and high levels of blood pressure. This question has recently been subjected to close scrutiny by Master and colleagues¹ who base their views on physical findings in about 75,000 adults. Consideration of their work shows that there can be no rigid definition of the normal blood pressure. They confirm the impression that although people in their teens and twenties normally have blood pressures that are well below the usually accepted 140/90, the levels in otherwise normal middle-aged and elderly people often exceed this value. If we try to define the incidence of so-called hypertension in people who are otherwise healthy, we must, of course, accept some rather arbitrary blood pressure level as separating the normal from the abnormal. Again using Master's data, we see clearly that the incidence depends entirely on our definition (Table I). If 140/90 is accepted as a dividing line, as custom often requires, relatively large numbers of people, especially in the older age groups, must be classified as abnormal. If we go to the other extreme and set 180/105 as the dividing line, the number so classified is much smaller. It seems likely, in the older groups at

least, that the 180/105 dividing line is more realistic than the 140/90 level. The blood pressure alone, therefore, turns out to be a rather unsatisfactory means of separating healthy from un-

COURSE OF ESSENTIAL HYPERTENSION
(BECHGAARD)

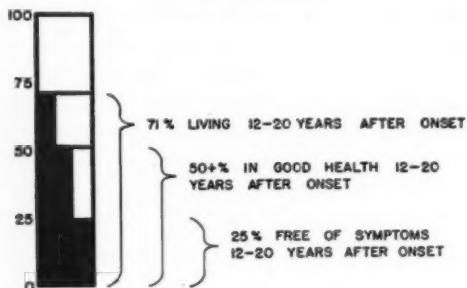


Fig. 1. The course of essential hypertension in 1,002 patients followed by Bechgaard¹ for seven to eleven years.

healthy individuals. Standard statistical assumptions show that a certain number of normal persons have blood pressure levels that are well above or below the average figure for the group. On this basis, Master and colleagues have calculated lower and upper limits of normal for persons of various ages. Above and below these limits are borderline areas and blood pressure readings that fall within them may or may not indicate the presence of disease. There is no way of knowing how accurate these limits really are, but the data strongly suggest that many individuals are wrongly classified as abnormal on the basis of the blood pressure alone. The work also shows how very badly we need some measurement *other than* the blood pressure to help us separate those individuals who usually show somewhat elevated blood pressures but who have no actual disease from those who, with comparable blood pressures, actually have early essential hypertension. In any case, a single abnormal measurement of the blood pressure is rarely sufficient evidence on which to base the diagnosis of essential hypertension. In a study conducted by Dr. Ancel Keys and co-workers at the University of Minnesota, 283 middle-aged men have been carefully examined every year for five years. Thirty-five and seven-tenths per cent of the group showed systolic blood pressure readings of 140 mm. Hg or above, and/or diastolic readings of 90 mm. or over *at least once*

during the five years. But only 10 per cent of the group consistently showed readings at or above this level. Should the 25 per cent who do not consistently show levels of 140 systolic and/or 90 diastolic be called hypertensive and should treatment be instituted? In the absence of other evidence of disease, the burden of proof is surely on the man who answers these questions in the affirmative. Even if, as the study proceeds, they do indeed prove to have essential hypertension, the question of treatment is still a moot one.

Natural History of Untreated Essential Hypertension

It is difficult to be certain that any method of treating essential hypertension actually alters its course. Until recently, documentary evidence to show the course of the untreated disease has been lacking. Without this knowledge, it has been impossible to gauge the long-term effect of treatment of any kind. The information now at hand puts us on firmer ground. Two large studies, one by Bechgaard,¹ and the other by Frant and Groen,² are in good agreement. They show that essential hypertension, *considered generally*, is indeed a benign disease. We should note, however, that no single patient is really described by an average figure and that each needs careful individual evaluation, preferably over considerable periods of time. Bechgaard's large study shows that about 71 per cent of patients with essential hypertension survive at least twelve to twenty years after onset and that over half of them remain in good health for such a period (Fig. 1). By good health he means that over half of his patients continued at productive employment or were able to lead relatively normal lives. Only 25 per cent of the group, however, remained asymptomatic for this length of time and the fact deserves comment. Symptoms in essential hypertension may or may not be directly due to the fact that the blood pressure is elevated. Some of them are definite enough. Dyspnea on exertion and complaints relative to cerebrovascular accidents—actually symptoms of sequelae of hypertension and not of elevated blood pressure itself—are unmistakable and usually can easily be separated from subjective complaints. But what of the headache, nervousness, and fatigability that are so frequently non-specific symptoms, possibly of iatrogenic disease and may well represent anxiety symptoms rather than direct symptoms

of hypertension itself? If we had some way of distinguishing clearly between organic and non-organic symptoms in patients with essential hypertension, it seems safe to assume that far more than 25 per cent of Bechgaard's cases would have been put in the asymptomatic category.

These generalizations apply to essential hypertension *en masse*. They are well supported by reliable data but leave out all consideration of age-sex factors. For this reason, they are somewhat misleading. Looked at more analytically, the data show clearly that established essential hypertension is a serious disease in young people and especially in young men, not so serious in middle-aged people of both sexes, and a mere annoyance in the elderly. More specifically, according to Bechgaard, a man who develops definite essential hypertension between the ages of thirty and forty-nine is eight times more likely to die within ten years of onset than is a comparable normotensive man over the same period of time. Women, in contrast, who develop the disease between thirty and forty-nine are only 1.4 times more likely to die during such a period of time than are comparable normotensive women. Men and women who develop the disease between the ages of fifty and sixty-nine have an excellent chance of living out a normal life span and attempts to treat the disease in this age group, except in unusual cases, are often ill-advised. These data suggest that overtreatment may have been the rule rather than the exception in the management of many cases of essential hypertension but they underscore the urgent need for effective therapy of the disorder, particularly when it occurs in young people and especially in young men.

Treatment of Essential Hypertension with Drugs

A clinically feasible method of controlling essential hypertension with drugs is not available. There are, however, many drugs which cause lowering of the blood pressure, almost all of which have, at one time or another, been recommended in the treatment of the disorder. The profession has quite rightly developed a rather critical attitude toward new depressor agents since so many have come and gone without contributing much to the year-to-year management of hypertensive patients. Depressor drugs do not, of course, strike at the cause of essential hypertension but, theoretically at least, if a prolonged

depressor effect could be achieved, many of the worst sequelae of the disorder would be avoided or postponed. Toward this goal three groups of drugs are currently under investigation: (1)

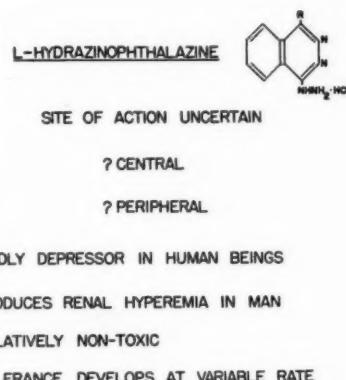


Fig. 2. The chemical structure and pharmacologic characteristics of 1-hydrazino-phthalazine.

adrenergic blocking agents, (2) drugs acting centrally or centrally and peripherally, and (3) ganglionic blocking agents.

Adrenergic blocking agents, also known as sympatholytic drugs, are thought to abolish or modify arteriolar constriction by direct action on the vascular wall or on the nerve endings in it. Several such drugs, including dibenamine and dibenzyline (688-A) have been tried in the treatment of essential hypertension with as yet inconclusive results. We have had no experience with them.

L-hydrazino-phthalazine, a drug thought to act centrally and known to produce renal hyperemia in the human being, has recently been introduced in the management of essential hypertension (Fig. 2). It has been found by Schroeder⁶ to exert a mild depressor effect in patients with benign essential hypertension and a more marked depressor effect in patients with the malignant phase of the disorder. The drug appears to be relatively non-toxic and its effect is said to be enhanced by previous lumbodorsal sympathectomy. Tolerance to the drug probably develops over a variable period of time and it has not yet been shown to be effective in controlling essential hypertension over long periods. In our own hands, the drug has produced a moderate decrease of blood pressure in patients with severe essential hypertension but it has not been possible to main-

tain the effect more than a few weeks. Schroeder⁶ reports probable benefit extending over many months. At best, however, the drug temporarily moderates the course of essential hypertension

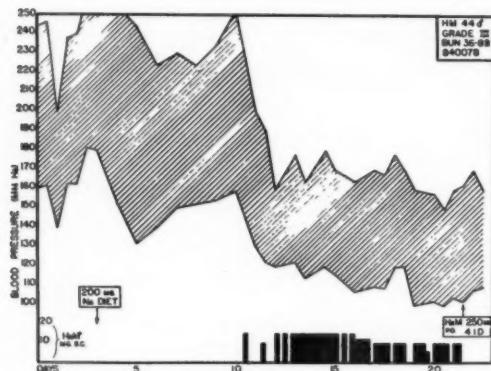


Fig. 3. Depressor effect of parenteral hexamethonium in a patient with severe essential hypertension.

and, as pointed out by the above author, rarely restores the blood pressure to normal levels for any length of time. The drug, although commercially available, has not had adequate clinical testing and its place in the management of essential hypertension is still uncertain.

Ganglionic blocking agents have recently attracted considerable attention. The first drug of this type to be investigated (tetraethylammonium) proved to have a very brief depressor action and for this reason was impractical as a means of controlling essential hypertension. More recently, longer acting drugs of this type have become available in the forms of penta- and hexamethonium salts.⁵ When administered parenterally, the hexamethonium form produces a moderate to extreme depressor effect lasting up to about two hours. Although caution must attend its use, it is relatively non-toxic and can be used over long periods of time. Unfortunately, tolerance to the depressor effect of the drug is rapidly developed.

Studies on the effect of parenteral hexamethonium have been in progress at the University Hospital for about a year. Patients with severe, symptomatic essential hypertension have been used as test subjects. An initial 15 mg. dose of the drug is given intramuscularly and its effect on the supine blood pressure is carefully followed. If there is no effect, doses are increased by 15 mg. at three hourly intervals until a satisfactory response is obtained. This dose is

then continued at three to six-hour intervals. The largest single dose determined in this way was 100 mg. After several days, it is usually necessary to increase the dose still further in order to maintain a satisfactory depressor effect and after seven to ten days it becomes impossible, in most cases, to maintain a satisfactory depressor effect without, at the same time, producing marked side-effects.

In one group of twelve severely hypertensive patients treated in this manner, definite lowering of the blood pressure was maintained for an average of 8.4 days. The relief of symptoms, especially of headache, was striking. The average fall in systolic pressure over the period was 48 mm.Hg. and was 27 mm. in the diastolic. Only three of the patients, however, showed more than momentary falls to normal (below 140/90) during the period of treatment. The fall in pressure in one patient is shown graphically in Figure 3.

Attempts to control the blood pressure in severely hypertensive patients over longer periods of time with parenteral hexamethonium have been disappointing. Three of the twelve were taught to give their own injections two or three times daily and were followed at weekly intervals in the clinic for two to three months. Although the remission in symptoms continued, the blood pressure levels returned to, or nearly to, the pre-treatment levels. It was not possible, for various reasons to continue the parenteral treatment after discharge from the hospital in the remaining nine patients. Seven patients, however, were treated while in the hospital with parenteral (intramuscular) hexamethonium and then were treated with an oral form of the drug. As with the parenteral drug, the dosage of the oral preparation varies a great deal from patient to patient. It runs about ten times the parenteral dose and, in some patients, we have used up to 3 grams of it a day. The average control blood pressure in the group was 211/132. Treatment with parenteral hexamethonium reduced the average to 170/111. Subsequently, treatment with oral hexamethonium for two to ten weeks resulted in an average blood pressure reading of 189/114 for the group. We infer from our experience that the parenteral form of the drug is more effective and more predictable than the oral form but that the latter is not totally devoid of depressor effect (Fig. 4).

It should be noted that the above figures are

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averages that cover the entire period of a given type of treatment. This method of expressing results conceals the fact that most hypertensive patients show a maximum depressor response to

remaining four patients are still living and show grade III eyegrounds. All still have marked hypertension but have temporarily weathered a malignant crisis, possibly owing to treatment with

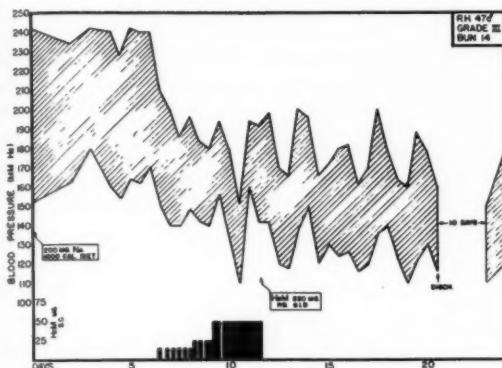


Fig. 4. Effect of parenteral, followed by oral, hexamethonium in a patient with severe essential hypertension.

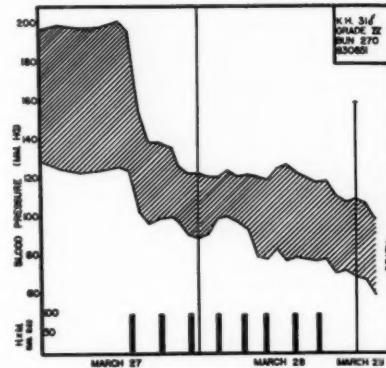


Fig. 5. Depressor effect of parenteral hexamethonium in a patient with malignant hypertension and progressive uremia.

hexamethonium soon after treatment is begun. Subsequently, although doses are steadily increased, blood pressure levels tend to rise presumably owing to the development of tolerance to the drug. To describe results in terms of *maximum depressor response*, however, is clearly misleading although it makes the results seem much more striking; day-to-day therapeutic results are of little significance in the lives of patients suffering from a disorder that characteristically lasts for years.

In six patients with malignant hypertension, as evidenced by grade IV eyegrounds, there was moderate to marked decline in blood pressure after institution of treatment with parenteral hexamethonium. In all six, papilledema disappeared and in several there was recognizable diminution in retinal vascular constriction. As in the non-malignant group, relief of symptoms was striking. Temporary benefit was thus obtained in all six patients but the evidence does not yet suggest that use of hexamethonium significantly altered the course of the disease. One young man, with very fulminating malignant hypertension, showed a very satisfactory depressor response to the drug but the BUN continued to rise and the patient expired three days after treatment was begun (Fig. 5). Another patient in the group improved temporarily but died after adrenalectomy was performed. The

hexamethonium. Other types of hypertensive crises have been treated with the drug with some success. One patient, an eight-year-old boy, probably suffering from some type of renal hypertension, developed hypertensive encephalopathy with convulsions. Hexamethonium promptly lowered the blood pressure and terminated the convulsions but, probably because of the development of tolerance, the pressure rose again during the next few days. Subsequently, various combinations of drugs and diets brought the patient under fair control but maintenance has been difficult and he is now about where he started. It seems to us that, as matters now stand, the hexamethonium compounds are undeniably useful in the management of hypertensive crises but that some modification of them will have to be made before they can be adequately evaluated in the long-term treatment of essential hypertension.

The use of 1-hydrazino-phthalazine in combination with hexamethonium has recently received considerable attention.³ The most valid reason for using hexamethonium and 1-hydrazino-phthalazine in combination is that such use delays the development of tolerance to their depressor effects. By giving the drugs in alternate doses, it is possible to maintain a fairly constant effect without giving either drug so frequently that rapid tolerance develops. Our own experience with the combination is too small to permit firm

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conclusions. The combination, when applied to five patients in the hospital, had a depressor effect that was comparable to that observed when hexamethonium alone was used. The combination has failed, in our hands, to maintain a significant depressor effect after patients were discharged from the hospital to be followed in the clinic. We have not attempted to instruct the patient or a member of his family to take the blood pressure and to adjust the dose of the drug accordingly. The technique seems to us to be ill-advised in view of the probable unreliability of the sphygmomanometric readings. In addition, there is good reason to question the wisdom of directing the patient's attention so constantly to the level of his blood pressure. In any case, there is no satisfactory proof that hexamethonium alone or in combination with 1-hydrazino-phthalazine can effectively control essential hypertension on a year-to-year basis.

It is, therefore, still out of the question to speak of curing essential hypertension by means of drugs and the prospect for a convenient, easy way of controlling it by the use of drugs over long periods of time is not particularly bright. On the other hand, it is not unreasonable to expect that the newer depressor drugs can be improved, that more effective dosage schedules can be worked out, and that the development of tolerance to the effects of the drugs can be overcome to some extent. With the prospect of having several safe and effective depressor drugs at hand, and with the knowledge that depressor dietary measures can be safely applied for limited periods of time, effective long-term treatment of the disease may well become a reality. We may, in this way, be able to retard the development of the cardiovascular, and possibly the renal sequelae, for very considerable periods of time. But the basic disorder underlying essential hypertension, whether it be physiologic, biochemical, psychiatric, or all three, still escapes us.

In conclusion, we can answer the two questions posed initially only partly:

1. Attempts to treat essential hypertension by means of drugs should be limited to patients with severe, or rapidly progressing, forms of the disorder. An aggressive therapeutic attitude, however, should be adopted in dealing with well-established essential hypertension in the younger age groups and especially in young men.

2. Safe and practical methods of controlling hypertensive crises by the use of drugs are avail-

able. The long-term management of essential hypertension with drugs is not yet established as therapeutic fact.

Acknowledgments

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"ERADICATION" URGED

Representatives of all organizations interested in brucellosis in fourteen states met in Saint Paul in July, 1952, and launched a unified and determined campaign for eradicating this disease in cattle. The point was stressed throughout the discussions that only by eradicating brucellosis in animals can it be kept from infecting human beings.

Formation of statewide brucellosis committees in each state was recommended. It was agreed that all available means should be used to wipe out brucellosis—ring-testing of milk, blood-testing of animals in herds shown by the milk test to be suspect, calfhood vaccination where indicated, identification and ultimate elimination of reactors, quarantine of infected herds, and restrictions on the movement and sale of infected or untested animals.

The opinion was voiced at the meetings that Minnesota is outstanding in the degree of co-operation existing among various agencies working for the eradication of brucellosis. Other states represented at the conference were Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Montana, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Participating in the discussions were representatives of dairy, beef cattle, and swine raising groups; agricultural and farm extension organizations; veterinarians, animal disease control groups, health and medical groups, and the agricultural press, from both state and national levels.

Ralph L. West, D.V.M., secretary and executive officer of the Minnesota State Live Stock Sanitary Board, served as chairman. He was empowered to call the group together again when the need arises. A full report of the proceedings is being prepared and will be sent to each of the participants.—*Minnesota's Health*.

NASAL HEMORRHAGE

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A VERY frequent condition which the general practitioner and specialist alike are repeatedly called upon to treat is that of nasal hemorrhage. Often occurring at night, it probably takes care of itself more times than we realize, but those cases which the physician sees usually require some kind of treatment. As we will see later, it is coming to be more and more a geriatric problem.

A review of nasal anatomy, while seemingly elementary, is worthwhile in considering the treatment in severe and resistant cases.^{1,4} The numerous venous plexuses and arterial anastomoses present in the nasal region have been demonstrated by Batson in his dissections. The arteries of the nose come from the branches of the internal and external carotid. The anterior ethmoidal artery is a branch of the ophthalmic artery which supplies the area of the anterior-superior portion of the nasal cavity. From the external carotid, the septal branch of the labial artery, which is a twig from the external maxillary, supplies the extreme anterior end of the nasal septum. The alveolar branches of the internal maxillary supply the mucosa of the maxillary sinus, while a pharyngeal branch, also from the internal maxillary, supplies the mucosa of the sphenoids. The descending palatine branch of the internal maxillary passes through the palate into the incisive foramen and anastomoses with the sphenopalatine, which is the most important branch of the internal maxillary. The sphenopalatine enters the nose through the sphenopalatine foramen near the posterior end of the middle turbinate. The medial branch enters the septum and the lateral branch the turbinates, maxillary and ethmoid sinuses. The veins are very numerous and follow the arterial blood supply closely.

There are many causes of nasal bleeding. Trauma, self-induced, accidental or surgical, is a frequent cause. Surgical trauma occurs after intra-nasal operations or adenoidectomy. Arteriosclerotic vessels in older persons commonly bleed at night spontaneously and often require medical attention. Hallberg states that over 40 per cent of patients requiring hospitalization for epistaxis

have hypertension, arteriosclerosis or both. They have an irritating tendency at times to stop before the physician arrives or soon afterwards, only to begin again the next night, and soon your patient is exhausted and your patience likewise.

Blood dyscrasias and neoplasms may cause spontaneous bleeding requiring surgical intervention. Also seen are hemorrhages from acute infectious diseases of the nose, foreign bodies in the nose, violent exertion, high altitude, septal ulcers, chemical intoxication such as mercurial and phosphorous poisoning, angiomas or malignant growths of the nose, vicarious menstruation, and many constitutional diseases such as hemophilia, purpura, leukemia, syphilis, tuberculosis, certain iron-deficiency anemias, vitamin C deficiency and hypertension.

The site of the bleeding naturally determines the ease of the treatment. By far the most common source is the anterior inferior portion of the septum known as Kiesselbach's area. There is a rich venous plexus here that bleeds easily from trauma, nose picking or dislodging crusts. Farther back on the septum bleeding may occur also but, if visible, still does not present too difficult a problem. Bleeding from trauma may be so generalized and profuse and the parts so edematous as to make actual control by direct vision impossible. A deviated septum may also cause difficulty in exactly locating the hemorrhage and may even require submucous resection.

Bleeding in the posterior nasal area is usually impossible to visualize and presents a more difficult problem. The blood usually drains into the pharynx and can often be seen dripping rapidly off the tip of the uvula. A long dependent clot may hang down in the hypopharynx, and no bleeding be seen at all. On removal of the clot, bleeding will often begin again and be seen coming down from above. Sometimes the first evidence of renewed bleeding is pallor, sweating, cold skin, rapid pulse and sudden emesis of blood.

Control of nasal hemorrhage can be very simple or extremely complicated, depending on location and severity. Methods and materials used to control it are almost numberless and run from simple pressure to packing the nasal cavity with various

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agents soaked in various solutions. Often used are vasoconstrictors, chemical agents such as silver nitrate, phenol, trichloroacetic acid, chromic acid, Monsel's solution, tannic acid, salt pork, peroxide, vinegar, rubber balloons, Simpson splints, and so on, endlessly. More recently hemostatics of oxidized cellulose gauze or cotton have been found to be of considerable help.

Application of these methods varies with the case. Hemorrhage in children or adults with simple bleeding from Kiesselbach's area, if treated at home, can be controlled usually by pressure from a plug of either plain gauze or cotton in the nares. An easy method of control without using a pack is touching the bleeding point, if visible, with a chromic acid bead which one can easily make in the home. Similarly a local application of a mixture of equal parts of cocaine, phenol and menthol (Bonain's solution, used for anesthetizing the tympanic membrane) gives another use for this old remedy. In the office one can under good illumination use the actual cautery on these anterior bleeders. Injection of procaine and adrenalin solution or sclerosing solutions can help to stem the bleeding long enough to see what is going on and to better apply the actual cautery.

For inaccessible bleeding posteriorly which does not yield quickly to simple methods, it is better to put in a post-nasal tampon of adequate size and then pack the nares with vaseline gauze. Nasal packing should start at the most superior-posterior point, working forward and downward to the floor of the nose. In this type of case, bleeding will usually recur again and again and give the physician very little rest if the packing is delayed in the hope that it may be avoided. Nothing is more exasperating than to be called back in the middle of the night after apparently successfully stopping the bleeding several hours previously.

If an absorbable gauze packing is used, it should not be packed tightly because of the danger of producing a pressure necrosis of nasal mucosa. A post-nasal pack should be removed in forty-eight hours, according to many authorities, to avoid otitis media. Spar and Hallberg⁵ reported seeing blood in the middle ear in eight cases, and reported a case of osteomyelitis of the sphenoid with meningitis and cranial nerve palsy as another complication. The odor of putrefaction exuding from a patient with this packing in place very long is not pleasant, however, and can be partially

prevented by impregnating the pack with antibiotic powders or ointments to keep down bacterial growth. One should also give penicillin parenterally.

After removal of the packing in the nasopharynx, bleeding may seem to be controlled, only to have it start up again either spontaneously or induced by coughing, sneezing, or straining. Patients in shock brought on by loss of blood should be treated supportively along with the attempt to control hemorrhage.

If in spite of all these measures one still fails to control the hemorrhage by conventional methods, ligation of major vessels becomes necessary. The decision to perform such a procedure may be reached in a few days or a week, depending on the condition of the patient. When one sees the bleeding becoming intractable, it is better to go ahead and ligate while the patient is in fairly good condition. The nervous agitation of the patient, his family and friends and the physician's fatigue make it almost mandatory. Dashing to the hospital five or six times in twenty-four hours will weigh heavily on one's nerves. There is no point in waiting until the patient becomes so weak that he is in a state of deep shock. Hallberg² mentions that of 106 patients admitted to the Mayo Clinic from 1930 to 1947 for severe epistaxis, there were eleven that required ligation of the external carotid artery. One-half were fifty-five years of age or more, of which 40 per cent had hypertension, arteriosclerosis, or both.

The previously mentioned anatomical blood supply will govern the choice of vessel for ligation. Obviously most bleeding will yield to external carotid ligation, but if the anterior or posterior ethmoids are involved, the internal carotid or even the common must be tied off. The exact surgical technique will not be described here. It can be obtained in any standard text for those who are attempting it the first time. Hirsch,³ Sewall and others had several cases where the internal maxillary artery itself was tied off by going through the antrum as in a Caldwell-Luc operation and continuing on through the posterior wall of the antrum where the internal maxillary artery is located in the soft tissue of the pterygopalatine fossa. Bleeding stopped immediately on ligation. Here the difficulty is that it is primarily a procedure for the rhinologist and the work must be done through a very small opening with special instruments.

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Two cases which required ligation of the external carotid artery when all else had failed will be mentioned.

The first is that of A. P., aged thirty-five, a fireman by occupation, who was first seen on January 29, 1938. He had been cranking his car violently one cold evening when bleeding began spontaneously. He was sent to a hospital and a post-nasal pack inserted. Bleeding still took place through the pack, and it was removed and reinserted several times in the next two days. It would hold for a while and the pressure would tend to increase and the blood would filter through the pack. The condition of the patient became critical with the hemoglobin down to 55 per cent, the red cell count 3,000,000. The first transfusion was given January 31. His condition improved, but on the evening of February 1 about 1,000 cc. of blood were lost in a short time. At this time, on looking in the nasopharynx a spurter was seen high up in this area but nothing could be done to control it. It was decided after consultation to ligate the left external carotid artery. This was done February 3 with immediate cessation of bleeding. The patient rapidly improved and was discharged from the hospital February 10. There were no sequelae to the operation and no further bleeding occurred. In January, 1951, I performed a submucous resection of the nasal septum for difficult breathing and no untoward bleeding was encountered.

The second case was that of a stockyards worker who was injured by a cow on March 20, 1947. He had been bleeding for seven days when he was first seen. He

was first treated by packing and post-nasal packing inasmuch as no bleeding point was seen. The patient continued to bleed and was hospitalized March 31.

In spite of constant packing and repacking along with three transfusions there was no let-up in hemorrhage. On April 3 the blood picture was: hemoglobin 60 per cent, red cell count 3,340,000. A decision was made to ligate the left external carotid which was done April 3. The same results took place as in the preceding case and convalescence was uneventful.

Summary and Conclusions

Nasal hemorrhage can be a very simple condition or one that requires heroic efforts to prevent death. Individuals with serious protracted bleeding should be sent to a hospital and an immediate attempt made to control the loss of blood. While rarely necessary, intractable bleeding calls for ligation of major vessels as a life-saving measure.

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SOME FUNCTIONAL DISORDERS OF THE SMALL INTESTINE OF CLINICAL IMPORTANCE

(Continued from Page 937)

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BLOOD TRANSFUSIONS AND EXPANDERS OF BLOOD VOLUME

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THE present widespread dissemination of medical information to many individuals has led to considerable knowledge of the therapeutic value of blood, blood components and expanders of the blood volume, or so-called plasma substitutes.

Under average normal conditions, most communities have available either whole blood or one of the components of blood. However, these are not normal times, and the available supply of whole blood or one of the components might be inadequate if the demand were suddenly increased by a disaster or a series of disasters occurring locally or in the state as a whole. Minnesota is a valuable and vulnerable target. Consequently, it behooves the physicians in this state to be more than superficially familiar with the indications for the use of whole blood, the component parts of blood, and the various expanders of blood volume that are available commercially.

It will be of interest to all that the Committee on First Aid and Red Cross of the Minnesota State Medical Association passed a resolution on June 2, 1951, advocating the accumulation for use in event of civilian disaster of supplies of dextran, polyvinylpyrrolidone, gelatin or equivalent substances. This resolution was forwarded to Dr. A. J. Chesley, Executive Officer, Minnesota Department of Health, on June 23, 1951.²

Indications for Use of Blood and Blood Substitutes

For simplicity, the indications for the use of these therapeutic agents may be placed in one of five categories.

1. To Increase the Volume of Circulating Blood.—Reduction in the volume of circulating blood may result from operative or traumatic shock or from sudden massive hemorrhages of various types. The maintenance of proper blood volume depends to a large degree on an adequate reserve of tissue fluids. Patients who have lost much fluid,

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 27, 1952.

From the section of Anesthesiology and Intravenous Therapy, Mayo Clinic, Rochester, Minnesota.

as in prolonged vomiting or diarrhea, pass more easily into a state of shock than do those whose fluid balance is adequate. Therefore, the correction of a state of dehydration, anemia or hypoproteinemia is of real import. The best treatment for shock is prevention. The reduction in blood volume itself, and not the loss of erythrocytes, is the prime cause of death in such cases.

In the active treatment of shock, immediate restoration of the blood volume is of great importance. In this way, the life of the patient may be saved. If the reduction in blood volume is left untreated, shock may become irreversible.

Most authors agree that in either prophylaxis or active treatment of shock, nothing seems to have as good and as lasting an effect as does the transfusion of whole blood. If more than a third of the blood volume is lost during an acute hemorrhage, death usually results unless the fluid volume is replaced quickly. When hemorrhage is slow, the loss of two thirds of the blood volume may be withstood because of peripheral vasoconstriction and the pouring of intracellular fluid into the vascular system.

It is the general consensus that administration of whole blood is preferred for the treatment of reduced blood volume caused by loss of blood. However, under conditions that might develop at any time, it may be that our supply of blood would be insufficient or unavailable. In such conditions, resort should be made to the use of one of the components of blood or one of the so-called blood volume expanders. Several of the latter agents are available, namely, acacia, gelatin, pectin, periston and dextran.

The use of acacia is decreasing. It may be found in the liver and other organs weeks or even years after administration, and it may produce allergic or anaphylactoid reactions in the recipient.

Solutions of gelatin usually provide some osmotic effect for twenty-four to forty-eight hours. Gelatin is nonantigenic and usually is not retained in the tissues. However, it depresses the concentration of serum albumin, increases the sedimentation rate of erythrocytes and produces pseudoagglutination of erythrocytes. In the pres-

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ence of renal damage, the use of gelatin might well be avoided.

Administration of solutions of pectin increases the sedimentation rate and reduces the number of platelets. About half of the material is deposited in the body and its ultimate fate is not well understood.

Periston is a mixture of 50 cc. of 20 per cent polyvinylpyrrolidone in 236 cc. of Ringer's solution. This makes a 3.5 per cent solution. This material also increases the sedimentation rate. From 20 to 50 per cent of the amount administered is reported to be excreted in the first three days, but the manner of its elimination is unknown.

Dextran is a biosynthetic polysaccharide obtained from the fermentation of sucrose. The molecular weight varies from 50,000 to 105,000. The preparations of higher molecular weight seem to be more efficacious. Most of this material disappears in twelve to fourteen hours. A tenth to a half is excreted in the urine but the fate of the rest is unknown. Allergic reactions have occurred following its administration. Various commercial brands appear to have similar value in the treatment of reduced blood volume resulting from a measured hemorrhage. However, there is one preparation that has been found to increase the blood volume to a greater extent than others, according to Bollman and associates.

Bollman, Knutson and Lundy summarized their investigations of the use of various expanders of blood volume in restoring diminished blood volume resulting from a measured acute hemorrhage as follows: (1) The agents, in order of decreasing effectiveness, are dextran, gelatin, acacia and periston. (2) Dextran, gelatin, acacia and periston are about as effective as plasma, washed erythrocytes and whole blood. (3) Solutions of saline are ineffective in restoring diminished blood volume resulting from measured acute hemorrhage. (4) A state of adequate hydration is necessary to obtain the maximal effect from volemic substances.

The value of blood plasma was proved during World War II. However, it did not supplant whole blood, because it was found that many patients did not receive maximal benefit from administration of plasma until whole blood also was given. The occasional (in certain regions, the frequent) appearance of hepatitis ninety to

120 days after the administration of plasma discourages its use. Irradiation of plasma does not eliminate entirely the possibility of the transference of the offending agent in the plasma. The use of blood plasma in the Mayo Clinic has decreased greatly because there must be an avidly desired, specific therapeutic effect that plasma alone can supply before its administration is requested. On the other hand, occasions arise when the calculated risk must be accepted and plasma administered.

The use of fluids in the treatment of lowered blood volume may be summarized as follows: (1) Whole citrated blood is most desirable in such conditions as shock. Its use may be supplemented by use of one of the plasma expanders, if it is desired. (2) These supplements are effective for a limited period after administration. No more than a temporary therapeutic effect should be expected from their use. (3) The plasma expanders do not transport oxygen and therefore these agents should not be administered in unlimited quantities. (4) These supplementary agents may be lifesaving if blood is not available immediately.

2. To Increase the Capacity of the Blood for Carrying Oxygen.—This indication exists in patients who have reduced values for hemoglobin and erythrocytes occurring in such conditions as acute and chronic anemias, severe hemorrhages, certain blood dyscrasias or defective formation of blood. Such patients can expect beneficial effect only when the values for hemoglobin and erythrocytes are elevated by administration of whole citrated blood. It is good practice to provide transfusions of whole blood for patients who are in need of more hemoglobin and erythrocytes but whose physiologic mechanism has neither the time nor the ability to produce these two products. This is particularly true when the patient is being prepared for operation or when the patient is extremely ill.

The best estimate of the result of transfusions of whole blood should be based on the percentage volume of erythrocytes (as determined by the hematocrit) and the values for hemoglobin and erythrocytes, all of which determinations are made three to four days after the transfusion.

3. To Increase the Content of Protein in the Blood.—Occasionally it is assumed that a protein

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intake that is adequate for a healthy person is also adequate for a sick person. This is erroneous. A healthy man weighing 150 pounds (68 kg.) and measuring 69 inches (175 cm.) in height has about 235 gm. of blood protein, of which 150 gm. is albumin. This is responsible for 85 per cent of the osmotic power of blood plasma.

It is advisable to establish proper values for circulating protein prior to operative procedures and to maintain them during convalescence. If the amount of protein is inadequate, a greater tendency to shock may exist, edema of the intestines and other tissues may cause disruption of incisions, delayed healing of tissues may occur or the resistance to infections may be reduced.

Strumia and McGraw stated that it is possible to restore the total amount of circulating protein to normal in hypoproteinemic patients and to maintain these patients free from the complications usually met in hypoproteinemia by the intravenous administration of sufficient amounts of plasma proteins in the preoperative and postoperative periods. Injected plasma proteins are metabolized in a manner similar to that of ingested proteins, but they are not metabolized as quickly. It is probable that failure to observe an increase in plasma proteins after injections of plasma is caused by the fact that the concentration of plasma protein is measured rather than the total amount of circulating protein.

When the administration of blood plasma is to be considered, patients may be divided into two categories: (1) Patients may have normal reserves of protein but, because of shock or hemorrhage, experience a rapid decrease in the volume of the circulating blood. These patients respond readily to transfusions of whole blood or blood plasma. (2) Patients may have a lowered reserve of protein, and thus the lack of proteins in the tissues cannot be corrected readily by administration of blood plasma. Even the use of relatively large amounts of plasma may fail to produce a sustained and appreciable increase in the concentration of plasma protein in these patients. Nevertheless, administration of plasma to these patients generally is followed by a distinct therapeutic benefit, probably because of an increase in the total amount of circulating protein.

The loss of plasma from extensive burns is followed by hemoconcentration, producing decreased cardiac output and lowered flow of blood. Many workers still maintain that the use of

plasma and whole blood is the treatment of choice for burns.

The use of serum albumin in an attempt to decrease cerebral edema under certain circumstances has been reported.³ More recently, the use of a 20 per cent solution of dextran has been employed for the same purpose.²

4. To Increase Hemopoiesis.—Blood transfusion seems to have some beneficial effect on hemopoietic power, although the exact mechanism is not understood. It is generally agreed that dissolved hemoglobin stimulates the production of new erythrocytes by direct effect on the hemopoietic organs. Blood transfusions also increase the storage of iron in the spleen, bone marrow and liver. Blood volume expanders have no part in this effect.

5. To Increase Immunologic Factors.—The immunologic effects of blood transfusions are not understood satisfactorily. It is possible that transfusions have some therapeutic effect in infections, perhaps by causing a generalized improvement because of the addition of the blood cells of the donor and perhaps because of the addition of normal antibodies from the healthy donor.

Conclusions

Transfusions of whole blood are valuable therapeutic agents. The use of blood plasma and some of the component parts of the blood also plays an important role. The so-called blood volume expanders must not be disregarded entirely. They may be life-saving agents under conditions when the need for increased circulating blood volume is immediate but when whole blood or one of the component parts of blood may not be available immediately. These blood volume expanders should not be used to the exclusion of transfusions of whole blood. In some instances, transfusions of whole blood may be supplemented by use of these blood volume expanders.

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Case Report

HERPES ZOSTER

Report of a Case Occurring in an Infant Eight Months Old

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HERPES zoster occurring during infancy is extremely rare. In 1938 Lang³ reviewed over 10,000 cases of herpes zoster and stated that the highest incidence of the disease in infants was less than 0.07 per cent of all cases. Comby¹ reported eighty-four cases of herpes zoster in children, the youngest being eight months of age. After an extensive review of the literature, Freud et al² found only five cases of the disease in the newborn period. To these they have added a case of herpes zoster occurring in a three-day-old infant. The following case is reported because of the young age at which it occurred.

Case Report

B. T., a white female child, aged eight months, was admitted to Ancker Hospital on December 15, 1948, because of an eruption confined to the right side of the chest. The mother stated that the eruption began about three or four days prior to admission. About the time the rash appeared the child was fretful, seemed feverish, and developed a cough and rhinitis. The lesions started on the posterior aspect of the chest, and new ones appeared rapidly so that at the time of admission it assumed a hemithoracic contour. The child was not exposed to any known case of varicella, herpes simplex nor herpes zoster.

The baby was of normal birth, weighing 8 pounds, and was the youngest of seven siblings. She developed normally and had one previous admission to the hospital at the age of four and-a-half months for acute bronchitis, from which she made an uneventful recovery. During the interval between hospital admissions she was normal and did not have any skin involvement other than mild intertrigo.

Physical examination showed a well-developed, well-nourished and alert white female infant who was not acutely ill, nor in any apparent distress. The pharynx and tonsils were moderately inflamed. A zonal eruption corresponding to the distribution of the fourth, fifth and sixth thoracic nerves was seen on the right side of the chest. The eruption was made up of groups of tense

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OCTOBER, 1952



Fig. 1. Herpes zoster in an infant eight months old.

vesicles on an inflammatory edematous base. The lesions began just lateral to the thoracic spine and extended around the chest, ending anteriorly at the sternum.

The eruption healed within two weeks; the progress was usual and the recovery uneventful.

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President's Letter

A HIGH RATE OF INTEREST

A high rate of interest in state politics was evidenced in Minnesota's September 9 primaries.

Computation of this increased interest is accomplished through a brief glance at statistics. The Republican vote for governor, for instance, approximated 400,000; the DFL vote for the same office reached about 250,000. Both totals represent increases over primary votes in 1948 and 1950.

In 1948 the DFL party totaled 234,000 in the primaries in Minnesota; in 1950, the vote was 231,000. Republicans cast 379,000 primary votes in 1948 and 351,000 in 1950. A normal primary vote is about 580,000. This year's approximated 650,000 votes.

It is interesting to note that voting tends to increase in the state when a Presidential election is slated for the same year. Of course, a factor of considerable weight in this year's higher vote is the active "get-out-the-vote" campaign carried on by several public-spirited organizations. It can be hoped that this increase is a barometer for forecasting a higher rate of interest in the elections in November.

These statistics, no matter how encouraging on a state level, are sadly overshadowed by the figures on America's voting record in comparison to that of other free nations. In 1948, for example, there were about 96 million eligible voters in the United States. But in that year, only 49 million—about half of the eligible electorate—cast ballots in the Presidential election.

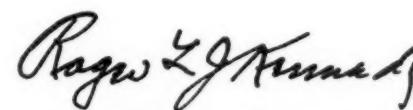
That figure becomes even more startlingly realistic when it is lined up—and at the bottom of the list—with the tabulation of votes for other nations:

Australia96 per cent voted in 1951
Great Britain83 per cent voted in 1951
Sweden80 per cent voted in 1950
Western Germany75 per cent voted in 1949
Canada74 per cent voted in 1951
Israel72 per cent voted in 1951
United States51 per cent voted in 1948

An admirable goal for any conscientious organization or individual citizen would be to do everything possible to move this nation up as far as possible on that list. A convincing campaign, pleading with citizens to vote, should not be necessary, for it should be considered a privileged duty to cast a ballot in a free election.

Professional people are not the least offenders in this poor showing of electoral interest. Doctors should work as hard as anyone to make better this higher interest which showed up in the primaries. The November elections can be the vehicle by which America can show the world that it is not lacking in an active political conscience.

A doctor's sincere pledge to become intelligently informed and then to turn that intelligence to voting on November 4 will be an example of good citizenship, and one of the finest ways to increase that rate of interest in vital local, state, national and international political affairs.



President, Minnesota State Medical Association

♦ Editorial ♦

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

CANCER DETECTION

HOW LONG, O Lord, how long?" This question is often on man's mind in many areas of his activity. In few areas of human endeavor is this question asked with more fervor than in the field of cancer. Patients, physicians and cancer investigators, probing this mystery of nature, all look expectantly and hopefully to the day when cancer will no longer be the dreadful scourge it is today.

We know much about cancer. But there is much more we do not know. And how can we know? Only through patient and unrelenting questioning of the nature of cancer; of how it comes about and through what agencies it can be thwarted or prevented.

For almost 200 years, since anatomy was first studied, with a view to the examination and classification of diseases which affect organs, cancer has been largely in the domain of the pathologist. During the past seventy-five years, surgeons have affected an increasing concern over management of the cancer problem. And for approximately forty years roentgen therapy has been a strong therapeutic ally in certain areas of the cancer problem. Latterly, notable gains in the palliation of certain cancers has been accomplished through hormonal therapy and a few temporarily effective chemotherapeutic agents.

Surgery continues to be the mainstay of present-day therapy of cancer. The lament of surgeons is that so many cases come so late. When the cancer is local and has not penetrated beyond the organ in which the cancer had its origin and the regional lymph nodes are not involved, granted a good cancer operation is done including excision of the entire potential lymphatic drainage area, the cure rate is in the area of 75 per cent for a large number of cancers (breast, uterus, colon and rectum). For the year 1944, at the University Hospital, the five-year survival rate for all gastric cancers was 17.7 per cent, and for the resection group, in which the lymph nodes were negative, it was 64 per cent. This latter figure for the five-year interval between 1941 and 1945 was 56 per cent, and the total survival rate

for the same period was 12.2 per cent. Bearing in mind the prevalent attitude toward gastric cancer of twenty-five years ago, this accomplishment offers a promising prospect.

Examination of our hospital records discloses the tragic situation that patients with gastric cancer are not coming to surgery earlier than they did fifteen years ago. In other words, as long as patients continue to come for treatment on the basis of symptoms, there will always be a fairly long lag phase. It has been quite definitely established for gastric cancer that the length of this silent interval is in the area of twenty months. It is very likely that the silent interval of other visceral cancers is of the same order of magnitude.

The major problem in cancer therapy today is the early recognition of cancer. Those words have rolled readily and comfortably off the lips of physicians for a generation. What has been done to give them meaning beyond the echo of a well-sounding but empty phrase? Sadly enough, very little. Can anything be done? Yes, indeed, something can be done, and now!

The figures published in this issue of MINNESOTA MEDICINE from the Cancer Detection Center at the University of Minnesota indicate that asymptomatic cancers are found frequently enough (1 per cent) among adults of more than fifty years to warrant continued probing of this method of attack upon the problem of earlier diagnosis of cancer. It is significant that, in more than 75 per cent of the cancers uncovered in this series, the regional lymph nodes were free of cancer. It is well known that when cancer is diagnosed on the basis of symptoms the converse is true; that is, lymph node involvement is observed in approximately 75 per cent of instances. It has become patently obvious in the last decade that the status of the regional lymph nodes in cancer is the most important determinant in the prognosis.

The promise of any idea is rarely apparent at its birth. Full maturation comes only with time. The techniques of the Cancer Detection Center are admittedly cumbersome and imperfect

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methods by which to recognize cancer. Yet, they are the best we have today. It would be nice to be able to detect cancer by far simpler means. And without question those means will come. Until simpler and more direct means are available, are we to hold back and say: all this labor is not worthwhile? That certainly has not been the attitude of the medical profession with other difficult problems.

The American people are expending many millions of dollars each year in the hope of resolving the cancer enigma. A considerable share of this expenditure goes for the support of research, and rightfully so. Research is the promise of the future. What is research? Will Mayo was fond of asking: should a method be discounted because it wears a practical label? The work of the Cancer Detection Center is imparting important meaning, comfort and hope to that easy phrase: earlier detection of cancer.

Every program has its detractors. This is not Utopia. The people of Minnesota and their physicians are making a contribution to earlier diagnosis of cancer in the support of the Cancer Detection Center. This activity, sponsored by the Council of the State Medical Association and supported by the Minnesota Division of the American Cancer Society, deserves the support of every physician in Minnesota. Progress is often painfully slow, for such, too, is the march of the mind. Not to advance is to retrogress. The work of the Cancer Detection Center indicates that progress in the recognition of cancer can and is being made by carefully selected screening tests. Who would discard these small gains until better methods are available?

In any issue affecting man, the two most important considerations are *cause* and *need*. That the fight against cancer is a great cause, no man need defend; that the need for better weapons is great is apparent on every hand. Cancer, when detected early, is curable. Let every physician lend his strength to meeting our needs in this important cause.

O. W.

Carcinoma of the gall bladder is notoriously an insidious disease and is usually not seen at an operable stage.

* * *

Abdominal pain, usually in the right upper quadrant, is the most characteristic symptom of gall-bladder cancer.

* * *

Cancer of the gall bladder, even in late cases, is often a relatively localized disease.

DOCTOR HENDERSON AND THE PRESIDENTIAL CAMPAIGN

ON SEPTEMBER 22, 1952, Dr. Elmer L. Henderson of Louisville, Kentucky, resigned as Chairman of the Co-ordinating Committee of the AMA which since January, 1949, has supervised the AMA National Education Campaign against socialized medicine. As of the same date Clem Whitaker and Leone Baxter, the director and manager respectively of the National Education Campaign, terminated their connections with the AMA. All three plan to devote their energies to the coming presidential campaign as individuals.

As the activities of the National Education Campaign terminate, it is only proper that appreciation should be expressed by the organized profession for the devoted service of Dr. Henderson who during these four critical years devoted his time and energies to the activities of the AMA. During these years he was president-elect of the national organization and simultaneously president of the World Health Organization. These gratuitous jobs are the biggest a physician can aspire to and are all man killers.

Dr. Henderson has come through what might be an ordeal to most of us with energy enough to be chairman of the newly formed National Professional Committee for Eisenhower and Nixon. This committee will enlist thousands of physicians, dentists, lawyers, engineers, accountants, pharmacists and other professional men and women in an aggressive bipartisan drive for the election of the Republican nominees for President and Vice President. Dr. Ernest Irons of Chicago and Dr. John W. Cline of San Francisco are vice-chairmen of the new committee as are also Harold J. Gallagher of New York, past president of the American Bar Association; Dr. Clyde E. Minges of Rocky Mount, North Carolina, past president of the American Dental Association; Robert Lincoln McNeil of Philadelphia, past president of the American Pharmaceutical Manufacturers' Association; Sidney L. Stolte of Saint Paul, past president of the National Society of Professional Engineers and John F. Forbes of San Francisco, past president of the American Institute of Accountants. Whitacre and Baxter will serve as campaign directors for the Eisenhower-Nixon professional committees drive. The committee members are no longer officers of their respective professional associations and can take active part in political affairs without fear of criticism.

EDITORIAL

THE COMMITTEE FOR THE NATION'S HEALTH

RECENTLY in a column by Thomas L. Stokes in the *St. Paul Pioneer Press* (September 19) appeared a reference to Dr. Channing Frothingham, a prominent Boston physician and head of the Committee for the Nation's Health. To quote, "The doctor expressed surprise 'that General Eisenhower wastes words in attacking a scheme of federalizing medical care which has never been proposed in any bill before Congress and which is supported by nobody, least of all by those who support the decentralized free-choice-of-doctor plan of national health insurance which is backed by the President of the United States, the Congress of Industrial Organizations, the Committee for the Nation's Health and many other organizations.'" The doctor is sorry that General Eisenhower has been taken in by the AMA which has spent millions of dollars in publicizing the idea that national health insurance is regimented federal medicine. He (the doctor) states that under national health insurance, the public would receive medical care in the same way they do now by going to the doctor or hospital of their choice, the only difference being that the doctor and hospital would be paid from an insurance fund collected by the federal government along with federal security payment paid by the employe or employer and allocated to the states. He claims that no new army of clerks would be needed to handle the mountain of details which would be added if such a plan were installed. Doctors and hospitals would have nothing to do with the federal government as they would be paid from funds allocated by the federal government to the states.

Who is this Dr. Frothingham, who voices the absurd opinion that national compulsory health insurance would not alter the present status of the practice of medicine and would not require another army of federal employes? He is and has been for some years the head of the Committee for the Nation's Health, one of the strongest forces behind the administration's campaign for compulsory, tax-supported national health insurance. On its membership roll are such names as Eleanor Roosevelt, Philip Murray, William Green, Robert Sherwood and Max Seham. According to Secretary Lull of the AMA, ninety-two out of the 166 charter members of the Committee

have been cited one or more times because of subversive connections or activities by the House Un-American Activities Committee. Over half of the members serving as officers and directors since its organization in 1946 have subversive records and have long been associated with avowed Communists. Poor company for good Americans!

DIABETES DETECTION WEEK

November 16-22

The purpose of designating one particular week as Diabetes Detection Week is to attract attention to the importance of detecting the unknown diabetic person. Diabetes, unknown and untreated, will lead to ill health and complications which could be forestalled by proper treatment. Here is one chronic disease for which, thanks to Banting and Best, there is a treatment which enables those with diabetes to lead normal lives, though it is not a cure.

The American Diabetes Association, Inc., with headquarters at 11 West 42nd Street, New York 36, New York, is again putting on a nation-wide Diabetes Detection Drive. State and local units are taking an active part in providing free testing of urine. The yearly drive merits the support of the profession.

MEDICAL ADVERTISING FIFTY YEARS AGO

We often think and with good reason that there is too much government regulation of our daily lives. One realm, however, in which there was a decided need, fifty and more years ago, of regulation was in the matter of the advertising of medical remedies in the lay press.

We recently had occasion to glance through a 1901 issue of a lay magazine published in Minneapolis and obviously catering to the interests of women. It is difficult to understand how such an array of advertisements of medical remedies so obviously false in their claims could ever have been tolerated. Intelligent readers must have recognized the falsity of the therapeutic claims so extravagantly made and the low moral tone of advertising in general in past years.

In this particular journal a Chicago doctor advertises that he can prevent blindness and cure all diseases and defects of the eye. An offer of one hundred dollars is made for any case of deaf-

(Continued on Page 968)

Medical Economics

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

HOXSEY CANCER CLINIC LOSES CASE

A recent decision of a U. S. District Court in Texas has prohibited distribution in interstate commerce of the brownish-black, and pink liquids intended for the treatment of cancer in man. The suit was against Harry M. Hoxsey and his clinic for treatment of cancer, which has been in operation in Texas. The Government had appealed an earlier decision favoring Hoxsey.

The trial was based on the grounds that pamphlets and booklets used by Hoxsey constituted labeling which was false and misleading and misbranded the drugs when shipped in interstate commerce. These booklets contained testimonials from many allegedly cured patients. At the trial much evidence was presented on results of experiments showing the ineffectiveness of the Hoxsey drugs.

According to a recent release of the Food and Drug Administration, "The Government presented scientific evidence that Hoxsey's claimed 'cures' fell into three categories: They included patients who had never had cancer and were treated for it at the Hoxsey Clinic; patients who had been cured of cancer before they went to the clinic and were treated for cancer; and patients who had cancer and still have it or who died under the Hoxsey treatment. In this connection, the Government presented the physicians who attended these patients and the hospital records connected with them, and pathologists who examined the tissue to make the diagnosis of cancer."

Principles Laid Down

The following important principles were laid down in the Circuit Court opinion, based on testimony by cancer experts:

"1. . . there is only one reliable and accurate means of determining whether what is thought to be cancer is, in truth and fact, actually cancer. This requires a biopsy, a microscopic examination of a piece of tissue removed from the infected and diseased region.

"2. . . the opinion of a layman as to whether he has, or had, cancer, or a like opinion as to whether he has been cured and no longer bears the disease, if, in fact, it ever actually existed, is entitled to little, if any, weight.

"3. . . despite the vast and continuous research which has been conducted into the cause of, and possible cure for, cancer, the aggregate of medical experience and qualified experts recognize in the treatment of internal cancer only the methods of surgery, x-ray, radium and some of the radio-active by-products of atomic bomb production.

"4. . . Upon such subjects a Court should not be so blind and deaf as to fail to see, hear and understand the import and effect of such matters of general public knowledge and acceptance, especially where they are established by the overwhelming weight of disinterested testimony."

False, Misleading Medicines

The court of appeals stated that "the overwhelming weight of the credible evidence requires a conclusion that the representation that the Hoxsey liquid medicines are efficacious in the cure of cancer is . . . false and misleading. The evidence as a whole does not support the finding of the trial court that 'some it cures, and some it does not cure, and some it relieves somewhat.'"

Clinic Operations Cited

The Court heard testimony describing the operation of the clinic, noting that most patients were charged \$400 for treatment. As many as thirty-five to fifty patients were "treated" each day. The method of treatment was to meet the patient, take pertinent information and then send him to a history clerk who took the patient's history, stressing previous diagnosis and treatment. Routine blood and urine examinations were made and x-rays taken. The patient then was sent to the Medical Director, an osteopath, who, on the basis of the history and laboratory findings, made the "diagnosis" and prescribed for the patient. The report from the Food and Drug Administration states:

"On leaving the clinic, patients are given a paper shopping bag containing the so-called 'supportive treatment' of vitamin preparations, laxatives, antacid preparations, and the cancer medicine (either the brown or pink

solution) which is referred to as 'the tonic.' Usually a 30-day supply is provided. The patient is instructed to write to the clinic about his progress and to request additional medicine, which is shipped without further cost. This procedure may continue indefinitely, but some patients are advised that they are 'cured' and discharged."

Medicines Described

Makeup of the cancer "cures" is described by the report from the Food and Drug Administration:

"The Hoxsey medicines are of two types: one for internal and the other for external treatment. The external treatment is composed of several escharotics . . . The internal treatment is composed of two medicines known as the black or brown medicine and the pink medicine. The black or brown medicine is composed of cascara sagrada, potassium iodide, extracts of buckthorn, prickly ash, red clover blossom, alfalfa, sugar and water.

"The pink remedy is composed chiefly of elixir of lactated pepsin containing variable amounts of potassium iodide. In addition to the above, which constitute the chief treatment, 'supportive treatment' consisting of preparations containing iron, urinary antiseptics, vitamins, laxatives, and antacids is administered."

HEALTH COMMISSION MEETS; HEARS MANY STATEMENTS

The President's Commission on the Health Needs of the Nation met in regional session in Minneapolis on September 2 and heard testimony from nearly fifty individuals and organizations. The nine-hour meeting included statements from medical, dental, consumer, labor and farm groups regarding what each thought the health needs of the area were, and what is being and what should be done about them.

Six Points Discussed

The commission's goal in this meeting was to direct inquiry into six points of health interests:

1. Current shortages in health personnel,
2. The adequacy of local public health units,
3. The present status and adequacy of medical research,
4. The degree to which hospitals and clinics meet existing needs,
5. The extent to which people are able to afford adequate medical care, with particular reference to present health insurance plans and their adequacy,
6. The adequacy of federal, state, and local health programs.

Association's Views Presented

The statement of the Minnesota State Medical Association was presented by its president, Dr. R. L. J. Kennedy, Rochester, Minnesota. Dr. Kennedy criticized the commission for its short duration and the meager time allotted to each participant. He stated: "It is necessary to preface our statement by making it clear that the doctors of Minnesota, undoubtedly the most competent group to know what the health needs of the state are, feel somewhat surprised and disappointed to have only been allotted ten minutes to cover the vast subject of health."

Dr. Kennedy then went on to enumerate the many excellent health improvements fostered by Minnesota doctors throughout the years—those improvements being major contributory factors in bringing Minnesota into the spotlight as one of the healthiest states in the nation. Dr. Kennedy stated:

"Since 1900 the average length of life in the United States has increased from 49.2 years to 67.2 years in 1948. In 1900 the total death rate in the United States was 17.2 per 1,000 population; for 1950 the rate was 9.6 per 1,000. The lowest mortality rates were in the states of this area—Iowa, Nebraska, Minnesota, North Dakota, South Dakota, Kansas and Wisconsin, each having a rate of at least 0.5 below the national average."

Calls Commission "Political"

After recounting methods by which the medical profession had met and continues to meet health problems, Dr. Kennedy described the feeling concerning the commission itself:

" . . . the physicians of Minnesota . . . feel that the hearing itself has been poorly timed; . . . that it is political by intent and nature, a product of those political forces which have constantly drummed the idea into citizens of our country that medical science and the doctors of the nation have not provided adequate health and who assert that the government can do better . . ."

Dr. Kennedy pledged medicine's continued efforts toward improving the already fine health conditions. He said, "We believe that the health needs of the nation are not overwhelming, that they are being solved by the continued efforts of men of medicine and related fields who are free to practice and work without interference and control, that future problems in this field will be solved most completely and most satisfactorily by a medical profession which remains free to continue its earnest quest for even better health for all people."

CIVIL DEFENSE ACCUMULATES SUPPLIES

Stockpiling of drugs, equipment and other medical items for civil defense has begun on a large scale. Seven regional warehouses in the nation are being used as storage places by the Federal Civil Defense Administration. In event of an attack they would be rushed to disaster areas to supplement local and state-owned medical supplies.

The Federal Civil Defense Administration estimates that on July 15 it had \$1,574,378 worth of supplies stockpiled. This is only 2.67 per cent of the more than \$60 million made available by Congress for this purpose. Most of the remaining supplies have been contracted for, and it is anticipated that a marked increase in the stockpiling will be noticed in months ahead.

Thirteen participating states have already received over \$3 million worth of supplies, a sixth of the amount on order. Nineteen other states, the District of Columbia and the territories have also joined, but supplies have not reached them as yet. In all, about 20 million dollars worth of medical supplies have been ordered by the states. This brings the total for all civil defense medical programs to 80 million dollars.

Items Listed

Antibiotics are the largest single item in both federal and state stockpiles at this time, Federal Civil Defense Administration reports. Other items include drugs, whole blood equipment, surgical textiles and some instruments.

Fiscal 1953 funds amount to \$60 million less than Congress allotted to the civil defense department for over-all expenses for fiscal 1952, ending July 1. The department will make a major decision on division of these funds; how much to spend on the whole blood program and how much on orders for other medical supplies.

KEEP ORANGE JUICE IN REFRIGERATOR

Unlike bananas, reconstituted frozen orange juice belongs in the refrigerator. Placed there, at 40 degrees Fahrenheit, "vitamin C losses will be negligible," states the Council on Foods and Nutrition of the American Medical Association. Vitamin losses occur when the reconstituted juice is allowed to stand in an open container at room temperature. According to the Council, "it is reliably estimated that approximately 98 per cent of the vitamin C content of the fresh fruit may be retained in the frozen concentrated juice when modern acceptable methods are used." (Council on Foods and Nutrition: J.A.M.A., 146:1-35, 1951.)

HYDROCORTISONE IN RHEUMATIC DISEASES

(Continued from Page 943)

cortisone acetate usually can cause a prompt alleviation of the acute disability. Perhaps the greatest practical use of this agent will be in various forms of traumatic arthritis.

6. A limited experience indicates no specific value in the local use of hydrocortisone acetate in acute periarthritis of the shoulder.

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MEDICAL ADVERTISING FIFTY YEARS AGO

(Continued from Page 965)

ness (caused by catarrh) that cannot be cured by Hall's Catarrh Cure. Several kinds of bust developers are advertised with illustration of what the user can expect. Vitalia cures cancer; Dr. Gunn's Liver Pills cure sick headache, clear the complexion and purifies the blood; Perry Davis' Painkiller affords a safe and quick cure for colic, croup, rheumatism and toothache; there are goiter cures, hair restorers, et cetera. Evidently health is not a new phase of public interest.

There was sore need for legislation to protect the less discriminating public from such fraudulent advertising. State laws directed toward dishonest advertising and the practice of medicine by other than licensed physicians as well as federal Pure Food and Drug laws and those affecting interstate commerce have done much for the public benefit.

Minnesota Academy of Medicine

Meeting of February 13, 1952

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, February 13, 1952. Dinner was served at 7:00 p.m. and the meeting was called to order by the Vice President, Dr. E. A. Regnier, in the absence of the President.

There were fifty-one members and four guests present. Minutes of the January meeting were read and approved.

Dr. Ritchie read the annual Treasurer's report, and

this was accepted.

The Secretary read a letter from Dr. John C. Brown, who is now living in California and who resigned. The Executive Committee recommended that his name be placed on the Senior Membership list. This was voted on and the transfer ordered.

The scientific program followed.

Dr. Asher A. White, of Minneapolis, then read his inaugural thesis on the subject, "Fallacy in Allergy," an abstract of which follows.

FALLACY IN ALLERGY

Abstract

ASHER A. WHITE, M.D.

Minneapolis, Minnesota

From the literature on allergy, an impression is gained of precise immunologic processes in operation in the production of disease. Despite the seeming clarity, when the physician begins to apply these methods in the study of the allergic patient, he finds that the expected results often fail to appear. As experience is gained, the student of allergy comes to realize that the methods of clinical allergy have serious shortcomings. The skin test is found to be unreliable, diagnosis of the allergic state uncertain, evaluation of offending allergens difficult and desensitization frequently misapplied. The present exposition is an attempt to reevaluate the known facts and to place fact and fallacy in perspective. We have attempted to pick out the fallacies, seek the reasons for their persistence, evaluate their results and review the facts with which they could be replaced.

The study of clinical allergy began after understanding of the phenomenon of anaphylaxis had pointed the way. The similarity between the dyspnea of the anaphylactic guinea pig and human asthma was apparent. Asthma and hay fever were observed to be concomitant so frequently that hay fever was also recognized as one of the manifestations of sensitization. Earlier work had suggested that airborne pollens were the cause of hay fever. It was a natural step to test the skin with suspected pollens and to attempt desensitization by increasing doses of the pollen suspected of causing trouble. The success of these methods gave rise to two basic errors of concept which underlie five additional fallacies. The fallacies must be abandoned and the underlying errors understood before the study of allergy can progress.

Underlying Errors

Fallacy 1.—Allergy follows the same laws which govern anaphylaxis.

Allergy and anaphylaxis are two different facets of the biologic process which results in the production of antibodies. There are important differences in the behavior of the two phenomena which lead to fallacies of procedure when the rules governing anaphylaxis are transposed to human allergy. The available knowledge of immunologic processes may be compared to an iceberg. There is below the surface or beyond present knowledge a large portion of the mass. It may be, however, that the portion of immunology which lies beyond the threshold of knowledge contains the facts which will afford a better understanding of the laws which govern human allergy.

Fallacy 2.—Accuracy of diagnosis in pollenosis is due to the accuracy of skin test data.

The physician usually conceives that cause and effect relationships will be clearly manifest for other allergens, since they are clear in pollenosis. It is not realized that the accuracy of pollen diagnosis is due less to skin test results than to the exact knowledge of the degree and time of exposure to pollens, knowledge which is seldom ascertainable in symptoms produced by other allergens.

Fallacy 3.—Allergy is easily demonstrated.

The truth is that in a high percentage of allergic patients cause and effect relationships are not determined even after the most expert search.

Fallacy 4.—Skin tests are accurate.

Corollary Fallacies (a) Positive skin tests indicate allergic disease. (b) Substances causing positive tests produce symptoms. (c) Negative skin tests deny allergic disease.

The immediate skin reaction to test substances is not an accurate indicator as to which substances produce

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symptoms. A positive skin test does not signify that the patient is the victim of an allergic symptom nor that the substance causing the positive test will produce an allergic reaction. Substances producing positive skin reactions frequently cause no symptoms after exposure thereto. A positive skin test must be regarded as no more than a clue, the validity of which remains to be determined. The patient who shows no positive skin tests is not necessarily free from allergic disorder. Symptom producing substances frequently evoke no skin response.

Falacy 5.—The manifestations of allergy are pathognomonic.

Most physicians recognize that infection and emotion may induce symptoms identical to allergy. They are prone to use the term allergy to describe these symptoms without regard to the symptoms' mode of origin. The term should be restricted to symptoms produced by the antigen-antibody type of reaction to agents foreign to the body economy. The unfortunate result of looseness in use of the term allergy is that patients with syndromes due to causes unrelated to immune mechanisms are skin tested for reagin and are given desensitizing injections to substances having no relation to the symptoms.

Falacy 6.—Small doses of allergen are symptom producing.

As a result of this erroneous belief inadequate methods of trial by exposure are used in evaluating allergic patients. In provocative feeding for instance, a small serving of the suspected food is usually offered. Experience indicates that in persons sensitized to a certain food, it may require three or four days of excessive feeding of that food before symptoms appear.

Falacy 7.—Desensitization will protect against skin test positive inhalants. Desensitization is a satisfactory procedure against many inhalants toward which allergy has developed. The fallacy consists in regarding skin tests as affording accurate evidence of sensitization. As commonly practiced the diagnosis of allergic agents depends upon skin testing and is, therefore, seriously inaccurate. From the results of skin tests a diagnosis of sensitization to bacteria, to fungi, to house dust, or to other agents is made. Having arrived at a diagnosis based on false evidence, the fallacious conclusion is reached that desensitization to agents so diagnosed will be effective.

Discussion

Dr. F. W. LYNCH, Saint Paul: I am glad to welcome Dr. White and tell him how much I enjoyed his sensible and sound discussion of allergy, a subject usually discussed with too much enthusiasm or with prejudice. It is said that eczema constitutes 10 to 30 per cent of the practice of allergists, and dermatologic practice includes many so-called allergic dermatoses, perhaps 35 per cent when the term is used broadly to include allergic reactions to drugs, contact dermatitis, and infectious and seborrheic eczematoid eruptions in addition to the atopic processes under consideration tonight. Practically all dermatologists agree with Dr. White's statement of

the fallacy of depending on skin tests for foods, at least in patients with urticaria or atopic dermatitis. Reactions to tests for inhalants are in a more doubtful category but certainly not completely dependable. I think Dr. White has clearly stated a reasonable view as to the need for demonstrating a probable relationship between the allergic disease and the supposed sensitivity to house dust, pollens, et cetera, before proceeding with extensive (and expensive) attempts at desensitization.

It has been profitable to have Dr. White review the evidence and attempt to determine what is factual and what is fanciful in our assumed "knowledge" of allergy. Only on a factual foundation can further advances be expected to develop.

DR. JEROME HILGER, Saint Paul: The allergic or altered-tissue reaction is common to all specialties. It is a striking thing to note the abhorrence with which most medical men regard the implication that they are allergists. It seems that this is due, in large part, to the narrowness with which allergists have approached the problem. Foods and inhalants have constituted the major part of their interest. As is apparent from clinical observation, on the other hand, altered-tissue reactivity is more commonly derived from physical or emotional relationships than from the food or inhalant environment. Unless these former factors be given their place of relative importance, the whole subject of allergy becomes a narrow, inept one. I am inclined to agree that having the allergists isolate themselves into a narrow field as a specialty in medicine is a mistake. On the other hand, it is certain that they could not become a broad specialty covering altered-tissue reactivity in its broad sense for they would be encompassing the whole field of medicine. The subject has a very profound basis in reactions other than antigen-antibody. Certainly, the basal ganglia and the dependent or related endocrine axis are the heart of the problem. Accordingly, in Otolaryngology, we feel that the first approach to an allergic problem, in the true meaning of the word, is not through antigen-antibody testing but at the more productive root of the subject—the patient's basic physiologic balance.

It is good to have the fallacies of the narrow antigen-antibody approach exposed so frankly and factually as has been done by Dr. White this evening.

DR. WHITE, in closing: At a meeting of allergists a few years ago, the matter of Board Certification came up. Most of the responsible men made strong statements against a separate Board for certification in allergy. The general membership, however, voted for a separate Board.

In regard to the relationship between emotionally induced symptoms and those which are produced by antigen-antibody reactions, one may speculate in this way. It is known that certain forms of allergy are produced by the liberation of histamine in tissue cells. It may be that the reason the same phenomena can be produced by emotional reactions is that the substance liberated at the end organ in para-sympathetic nerve activity is acetylcholine which is a histamine-like substance.

Dr. Hilger has discussed the subject from the standpoint of the rhinologist and here we see the difference in definition of terms to which all of us are subject. He has used the term to apply to the symptom complex of edema of the nasal membranes, obstruction to the passage of air, and hypersecretion of mucus. This complex has been given other names such as vasomotor rhinitis and hyperesthetic rhinitis. It may be produced by antigen-antibody reactions, by bacteria and by functional nervous reactivity. My own preference is to use the term allergy only for the antigen-antibody type of reaction. The vasomotor rhinitis of infection is an interesting problem. The allergist and rhinologist some-

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times discuss what is called intrinsic allergy of the respiratory membranes. The implication is that sensitization has developed to the bacteria which reside saprophytically or parasitically in the nasal membranes. There is, as yet, no proof as to whether this is an antigen-antibody phenomenon or one brought about by other forms of irritation. We simply know that it stim-

ulates the reaction produced when we apply allergen to sensitized nasal tissues.

Dr. H. B. Sweetser, of Minneapolis, read his inaugural thesis on the subject, "Hiatus Hernia Masquerading as Coronary Disease." Lantern slides were shown.

HIATUS HERNIA MASQUERADE AS CORONARY DISEASE

H. B. SWEETSER, M.D.

Minneapolis, Minnesota

Angina pectoris literally is pain in the chest. More particularly, pain in the chest brought on by exertion, by emotion, or by a large meal, and relieved by rest and by vasodilators, especially nitroglycerin. This may or may not be accompanied by an abnormal electrocardiogram. If the electrocardiogram is abnormal, we are usually quite satisfied with the diagnosis. If the changes in the electrocardiogram are minor or temporary, the patient is said to have coronary insufficiency; if they are severe and permanent, then the patient has a myocardial infarction. However, even with a normal electrocardiogram in the presence of chest pain brought on by exercise and relieved by rest or nitroglycerin, angina pectoris is the presumptive diagnosis.

In the past three years I have three times made a diagnosis of angina or coronary thrombosis in patients who had as the cause of their pain hiatus hernia and who were relieved of their disabling symptoms by repair of the hernia—but whose surgery was delayed three months to three years because I was unconvinced that this condition could cause their symptoms.

Para-esophageal or hiatus hernia has been recognized for years as a cause for chest pain. Apparently, the first description of this anatomic abnormality was made by Paré in 1575. The first suggestion of associated symptoms was by Morgagni in 1769. After that there was little in the literature until 1919. Since then, there have been a great number of papers concerning diaphragmatic hernia. It was not, however, until 1931 that it was recognized that this hernia could give symptoms simulating those of angina pectoris.

In 1941, Chester M. Jones of Boston published the most complete description of the clinical picture. Since then, the literature has been full of good papers concerning diagnosis and treatment.

The textbooks mention hiatus hernia as another cause for anginal pain, and mention, conversely, anginoid pain as a symptom of hiatus hernia, but in both cases only incidentally.

Hiatus hernia is not a rare condition. Harsha says it is found in one-tenth per cent of routine chest films, and in routine gastrointestinal x-ray studies it occurs in .75 to 1.2 per cent. Sixty per cent are said to occur in people over fifty years of age and 30 per cent between sixty and seventy.

Symptoms may suggest peptic ulcer, intestinal obstruction, gallstone colic, cardiospasm and coronary occlusion. The most characteristic picture seems to be

that of discomfort or pain on lying down and after meals, relieved by standing up and taking long breaths. The pain may be mild or severe, usually precordial, especially over the lower sternum or xiphoid and radiating either downward, usually to the left side of the abdomen, or occasionally upward toward the left shoulder, and sometimes down the left arm in the area characteristic of angina or coronary pain.

Report of Cases

Case 1.—A woman, aged sixty-seven, was seen in November, 1949. She had arthritis of the hands and a hypertension of 220/110. She was dyspeptic on climbing one-half a flight of stairs and had edema of the ankles after teaching all day. Glaucoma was already present, and two days after my first examination an operation was done for acute glaucoma. In February, 1950, she had a weak spell in class, and her dyspnea had increased so that she had to stop to rest two to five times on one flight of stairs.

On March 3 she had an attack of pain anteriorly in the left chest which radiated down the left side of the abdomen and was brought on by exertion. In the succeeding three weeks there were five similar acute attacks brought on by exertion or during meals, persisting until she vomited. On antispasmodics and sedatives there were three more attacks in ten weeks, the last one lasting four or five hours.

X-ray examination showed her hiatus hernia, and surgical repair was carried out on July 3, 1950 by Dr. Thomas Kinsella. One year later she had had no more of her "weak spells" and was able to climb stairs and carry on normal exertion, but was retired from teaching because of glaucoma and arthritis. Electrocardiograms before and after operation were normal and showed no change.

In this case, the location of pain was not entirely typical of angina pectoris, but the dyspnea on exertion and some elements in the onset of pain were. However, relief was obtained by repair of her hernia.

Case 2.—A man of fifty-three was seen in 1947 with a history of "angina;" that is, he had spells of pain under the sternum which radiated up to both sides of his neck and down both arms. These were precipitated by exercise, cold weather, and large meals, and lasted about five minutes. He had had a previous series of attacks four years before at the age of forty-four. He was slightly overweight; a moderate anemia was present, and his electrocardiogram showed a depression of S-T₁ and S-T₂ and a diaphasic T₄, which after a week became entirely positive. X-ray examination revealed a large para-esophageal hernia, but because of his cardiac condition, repair was not attempted. He changed

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his job, was careful about meals and exertion, and two years later was improved. In 1950 the attacks recurred, so in spite of his electrocardiogram changing and because of pain continuing, in June, 1950, his hernia was repaired by Dr. Leo Culligan.

After that he had no attacks of pain for over a year, but now his doctor tells me that his pain is again present. Because of this recurrence, x-ray examination of his esophagus and stomach was repeated in January, 1952, and this time showed a small recurrence of his hernia. If his pain persists, he will now have a phrenicotomy.

This patient's symptoms were more confusing than those in the first case and accounted for a delay of three years in repair of his hernia. If it were not for the close correlation in time between the presence and absence of his hernia and the presence and absence of symptoms, it would still be difficult to believe that he did not have two diseases instead of one.

Case 3.—A woman of sixty-eight was seen first on June 19, 1948, complaining of chest pain which radiated down the left arm. In 1946 she was said to have had a "blood clot in her heart" and was kept in bed for four weeks. She had a relapse and was kept in bed two weeks more. She had had "asthma" all her life and had had heart trouble for ten years. Her blood pressure was normal, 150/85. Her heart was normal on physical examination. The electrocardiogram was normal. She had a right rectus scar with hernia and a right inguinal hernia. Because of the character of her pain, my diagnosis was intercostal neuralgia. She had no relief from salicylates and heat, and two weeks later a diaphragmatic hernia was found by x-ray. She was treated with antispasmodics and sedatives, and was relieved for two weeks, when she was in an automobile accident and the pain recurred. After this she was seen at intervals for asthma (wheezes), left subdeltoid bursitis, pruritus ani and vulvi and pneumonitis. In February, 1951, she had "terrible" pains across her abdomen, relieved by three hot enemas.

In August, 1951, there was pain in her chest just to the left of the sternum radiating down the left arm but not to the shoulder, and she had trouble breathing. Her heart was normal, her blood pressure was 160/90, and the lungs were clear. However, her diaphragmatic hernia was much larger and so on September 20, 1951, her hernia was repaired by Dr. Kinsella. In November, 1951, she was still tired but had had no pain of "coronary type" at all and none down the left arm. The wheezing was much improved and she was thoroughly relieved that the pain which her family had come to consider as neurotic, had had a physical basis. Her electrocardiogram showed left axis deviation but was otherwise normal throughout.

In August, 1952, she was entirely well.

In each of these cases there was pain which was most suggestive of angina or of myocardial infarction. One showed changes in his electrocardiogram which were thought to indicate myocardial damage; the other two showed no change. However, the picture in all was complicated and contained elements not quite explainable on the basis of heart disease.

The mechanism of "anginal" pain from hiatus hernia seems well established. In the large hernia, it is possible that simple mechanical displacement of the thoracic structures can cause dyspnea and pain.

In smaller hernias, the pain seems to be a referred pain of visceral origin. The peripheral areas of the diaphragm are supplied by the lower six thoracic

nerves and pain from these areas is felt in the areas supplied by those nerves, i.e., in the side, back, and front below the sixth rib and down to the ilium.

The central part of the diaphragm is supplied by the phrenic nerve which arises from the third, fourth, and fifth cervical roots, and pain is felt in the skin areas supplied by the cutaneous nerves from these roots, i.e., in the shoulder, neck, and occasionally at the root of the thumb.

The esophagus is supplied by sympathetic nerves rising from the fourth to the sixth thoracic or, more likely, from the first to the sixth thoracic roots. Irritation of these nerves is felt in the upper thorax and on the inside of the arm and, if irritation is severe, it can extend to the distribution of the eighth cervical, i.e., to the little and ring fingers. Distention of the lower esophagus or the part of the stomach contained in the hernia, inflammation, or spasm initiated by emotion or excitement can all cause sympathetic over-stimulation and spasm in the smooth muscle. These motor disturbances are similar to those occurring in any hollow viscous and form the basis for most visceral pain.

Conclusion

Esophageal hiatus hernia is an important cause of symptoms which may simulate those due to serious heart disease. Differentiation, especially in the absence of electrocardiographic changes, may be difficult and depends, not only on a meticulous history and examination, but also on recognition by the physician that such confusion may occur at all.

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Discussion

DR. LEO G. RIGLER, University of Minnesota: I was very much interested in Doctor Sweetser's presentation because we have had a long experience with hiatus hernia. Doctor Ude and I, I believe, reported the first series of cases in this part of the United States, although a larger series had earlier been reported from Boston. This was in 1928. These hernias are frequently missed when mass examinations are made and only the upright position used. This is because they undoubtedly spontaneously reduce themselves, especially in the upright position, while the patient is walking about. I recall being called to the operating room recently where Doctor Wangensteen was operating on a patient whom we thought had a very large hiatus hernia. He was unable to discover the hernia, although he found a sac around the stomach. On further study it became evident the hernia had reduced itself under the influence of the anesthesia and the relaxation. Interestingly enough, although at least one-third of the stomach had been above the diaphragm prior to operation, the opening in the hiatus was really not very large. I cite this case only to indicate how often this spontaneous reduction occurs.

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In one of the films which Doctor Sweetser showed and in which he pointed to a peculiar shadow, the appearance was fairly characteristic of ulcer. It should be noted that hiatus hernia is commonly complicated by ulcer along the margin of the diaphragmatic orifice and this type of ulceration is one of the common causes of bleeding from the gastrointestinal tract.

We have had some experience with hiatus hernia causing symptoms similar to coronary disease. As far back as 1933, I can recall finding patients with hiatus hernia whose symptoms simulated angina pectoris. The famous story around our hospital concerns Dr. Logan Leven who, while he was a resident in our hospital, became acquainted with this syndrome. He then went to the Mayo Clinic where he saw the sister of a famous New York surgeon who had been all over the United States and been called a neurotic because of her anginal pains. On taking a careful history he found that the symptoms were greatly aggravated in the supine position, especially after she had been asleep, and he made a definite diagnosis of hiatus hernia which was later proved by X-ray examination.

Hiatus hernias are, in a large part, the result of sudden increases in intra-abdominal pressure which cause their herniation to occur although no doubt some change in the hiatus itself, either congenital in origin or as a result of age changes in the muscle, must first be present. With this in mind, Eneboe and I studied pregnant women to determine how much of a factor this was. We found evidence of hiatus hernia in about 20 per cent of multiparae and about 5 per cent of the primiparae. This compared with an incidence of something less than 2 per cent in the general run of our patients who came in complaining of symptoms. Interestingly enough, in the case of the pregnant women, after the termination of pregnancy, restoration to normal, occurred in a very high percentage of cases.

DR. T. J. KINSELLA, Minneapolis:—This subject is very interesting to me for several reasons. Confusion of this condition with coronary disease has been recognized for a long time. I remember well that Dr. Arch Logan taught us in 1921 that gall-bladder disease, hiatus hernia and coronary disease often presented similar symptoms.

Early in the picture, hiatus hernia may come and go as a sliding type of hernia in relation to position and abdominal pressure; hence, the necessity of making the x-ray examination in the Trendelenburg position. Symptoms in such patients may be relieved by lowering abdominal pressure by reducing weight. When in hiatus hernia the esophageal opening is into the pouch of the stomach above the diaphragm, ingestion of food distends the pouch pulling more and more of the stomach through the diaphragm. The occurrence of pain after a full meal or upon lying down should suggest hernia.

Dr. Kerkhof and I reported an interesting case last fall before the Minnesota Society of Internal Medicine. This patient had had a hiatus hernia which was repaired surgically and the phrenic nerve crushed. Six months later when pain recurred, a diagnosis of coronary disease was made. Dr. Kerkhof then saw her and recognized the trouble as a recurrence of the hernia. Relief was again obtained by interruption of the phrenic nerve. On two separate occasions about a year apart, recurrent pain was again diagnosed as coronary disease. Permanent relief was finally obtained by transthoracic resection of the phrenic nerve. The pain resulted from incarceration of a small gastric pouch. It is very important that the correct diagnosis be made for I am not anxious to operate upon a patient who has had a recent coronary infarction.

DR. C. N. HENSEL, Saint Paul:—It was back in 1945 that I first had my attention called to the fact that symptoms from hiatus hernia might simulate those arising from coronary sclerosis.

In the *Journal of the American Medical Association* for June, 1945, Doctor W. E. Clark of Washington, D. C., published an article entitled "Gastrointestinal Conditions Simulating or Aggravating Cardio-Vascular Diseases."

In this article he cited the case of a physician, aged fifty-two, who had attacks of pain over the sternum and down the arm, which would rouse him from sleep about 3 a.m. and were not completely relieved by $\frac{1}{2}$ grain of morphine. There was referred pain to the inner aspects of both elbows and the little fingers of each hand. Gastric symptoms were entirely absent. Fever was absent, the leukocyte count was normal, the electrocardiogram was normal and the heart examination was normal. He stayed in bed for four days. His symptoms persisted in a mild form, but were aggravated by nervous tension.

He took a vacation in Florida for six weeks and played golf with only slight lessening of chest and arm pain.

An orthopedist then diagnosed the pain as due to faulty posture and advised exercises which were taken from April to September, but these brought no relief.

Finally, since the pain was localizing over the lower third of the sternum and discomfort after meals (relieved by belching) was becoming more frequent, a gastro-enterologist was consulted and he suggested that the symptoms might be produced by an hiatus hernia and this was demonstrated by x-ray. The establishment of the diagnosis was of decided value to the morale of the patient.

Medical management for some months was of uncertain benefit. Radical cure by surgery was deemed unwarranted, but dilatation of the esophagus was performed and there was a gradual abatement of symptoms.

Not all patients with hiatus hernia have symptoms.

There appears to be three groups. The first has a short esophagus and the cardiac end of the stomach is up in the chest and has probably always been there—these are apt to be symptom free.

In the second group the hiatus is large enough so that the stomach can herniate into the chest and return again below the diaphragm and not get caught. These also are apt to be symptom free.

In the third group the hiatus is small and when a small portion of the stomach herniates, it is apt to be caught and become incarcerated. This type is likely to cause symptoms.

Dr. Clark believes that patients with hiatus hernia are more apt to have symptoms with eating than with effort.

Dr. Tinsley R. Harrison in an article on "Clinical Aspects of Chest Pain" *American Journal of Medical Science*, 207:561, 1944, reported two interesting cases of angina of effort who also had attacks of chest pain on lying down.

Case 1.—A white man, aged fifty-five, complained of a feeling of sternal pressure radiating to the left shoulder, brought on by walking and relieved in 3-8 minutes by rest.

He had also noted that when he would lie down, the discomfort would set in within a few minutes and would become progressively worse until he assumed a sitting position, when the pain gradually disappeared. He insisted that the discomfort produced by lying down was identical in location and character with that caused by effort. However, the discomfort in the recumbent position tended to last longer if he remained in this posture. Sitting in a chair with the feet elevated would likewise produce a typical attack, while sitting in a chair in an upright posture with feet on the floor did not produce pain. Nitroglycerine relieved the pain produced by effort and also that produced by recumbency.

MINNESOTA ACADEMY OF MEDICINE

Repeated roentgenologic studies of the stomach revealed no evidence of hiatus hernia.

Electrocardiograms were made in various positions and also before and after exercise. It was found that the recumbent posture produced the same inversion of the T-wave in Lead I as occurred following effort.

Several months later, while walking slowly, the patient suddenly fell to the ground and expired.

This is an example of angina decubitus. The mechanism of pain production here is unknown.

Case 2.—A white woman, aged sixty-five, had had several attacks of "pressing" pain localized just to the left of the sternum in the precordial area, while washing dishes, and two attacks while walking uphill. Standing still or sitting quietly brought relief in a few minutes. In addition she had had numerous attacks of a similar nature on getting into bed.

Five weeks before admission to the hospital she had a severe attack of pain lasting several hours and associated with an initial rise in systolic blood pressure at 180 mm. followed by a fall to 120 mm., her usual pressure being about 160 mm.

Several days later her physician heard a friction rub over the precordium which disappeared in 48 hours; at the time she had a slight fever.

When she was seen some weeks later the physical examination was negative except for minimal hypertension and slight cardiac enlargement.

Electrocardiogram revealed inversion of T-wave in the precordial lead.

Fluoroscopic examination of the stomach showed a small hiatus hernia.

Note: The pain induced by recumbency was not relieved by nitroglycerine, but was benefited by atropine.

This patient has both coronary disease and hiatus hernia.

Dr. Chester Jones has collected 128 cases of hiatus hernia from his own personal cases and from those of the Massachusetts General Hospital. He found that the intake of food, especially a large meal, initiated substernal pain in fifteen out of twenty cases of hiatus hernia. Rather less frequently the act of lying down initiated symptoms of substernal pressure.

He found that nitroglycerine gave some relief, but was not the prompt and characteristic relief that is usually obtained in angina. However, belladonna gave relief to pressure in the chest, in eleven out of eighteen cases.

Since reading this article, I have had all my patients with doubtful chest pain examined in the head-down position for hiatus hernia, but so far I have found none.

DR. EDWARD T. EVANS, Minneapolis.—As a preface to my discussion, may I inform the members that I was a general surgeon from 1922 to 1926. In the reports of the Western Surgical Association meeting of 1924, you will find a case report of my father's in which he and I did a Polya anastomosis, which was carried out between the esophageal sacculation and the stomach because the sac could not be mobilized. I recall that I had a discussion with Doctor Adson as to whether or not one could safely sacrifice the left vagus and phrenic nerve if necessary.

In the historical review, I feel that Doctor Truesdale, of Providence, Rhode Island, should be included because his contributions to this subject were pioneer.

DR. WALLACE RITCHIE, Saint Paul: There is another addition to that list of gall-bladder disease, hiatus hernia and coronary disease, and that is cervical disc. It is rare, but it does exist.

The meeting was adjourned.

WALLACE P. RITCHIE, M.D., Secretary

AUREOMYCIN IN INFECTIONS OF THE URINARY TRACT

(Continued from Page 948)

in which there was obstruction of the urinary tract or an indwelling tube or both. There was no case in which the original organism was known to have changed its sensitivity or to have become resistant to the antibiotic used.

Treatment with aureomycin was stopped in one case because of facial edema; however, the patient was receiving cortisone also. In another case use of the drug was stopped because of nausea. A third patient complained of minimal anal burning in spite of the fact that she was receiving only 0.75 gm. of aureomycin a day.

Summary and Conclusions

On the basis of this study it is concluded (1) that almost all infections of the urinary tract caused by *Escherichia coli* and *Aerobacter aerogenes* may be controlled by small doses of aureomycin in spite of the fact that the results of present sensitivity tests made before treatment may indicate the contrary and (2) that *Pseudomonas aeruginosa* and *Proteus vulgaris* are usually not sensitive to aureomycin but, when *in vitro* tests are available, they may be found occasionally to be sensitive to the drug in the urinary levels attainable with large doses.

Streptococcus faecalis responded to treatment with aureomycin in all the 5 cases in which it was isolated; *Micrococcus pyogenes* responded in two of the three cases in which it was isolated.

The side reactions to aureomycin in the low doses here given were negligible.

No increase in resistance of the bacteria to aureomycin was discovered in this group of patients studied.

References

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2. Duggar, B. M.: Aureomycin: A product of the continuing search for new antibiotics. *Ann. New York Acad. Sc.*, 51:177-181 (Nov. 30) 1948.
3. Finland, Maxwell, Collins, H. S., and Paine, T. F., Jr.: Aureomycin, a new antibiotic. Results of laboratory studies and of clinical use in 100 cases of bacterial infections. *J.A.M.A.*, 138:946-949 (Nov. 27) 1948.



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REGULAR CORPS EXAMINATION FOR MEDICAL OFFICERS, USPHS

A competitive examination for appointment of Medical Officers to the Regular Corps of the United States Public Health Service will be held on January 6, 7, and 8, 1953. Examinations will be held at a number of points throughout the United States, located as centrally as possible in relation to the homes of candidates.

The Regular Corps is a commissioned officer corps composed of members of various medical and scientific professions, appointed in appropriate categories such as medicine, dentistry, nursing, engineering, pharmacy, et cetera.

Appointments will be made in the grades of Assistant Surgeon (equivalent to Navy rank of Lt., j.g.) and Senior Assistant Surgeon (equivalent to Lieutenant). In making assignments, consideration is given to the officer's preference, ability, and experience; however, all commissioned officers are subject to change of station and assignment as necessitated by the needs of the Service. Appointments are permanent in nature and provide opportunities to qualified physicians for a life career in clinical medicine, research, and public health. Applicants who successfully complete this examination may ordinarily expect appointment as soon as they become eligible.

Application forms and additional information may be obtained by writing to the Chief, Division of Commissioned Officers, Public Health Service, Federal Security Agency, Washington 25, D. C. Completed application forms must be received in the Division of Commissioned Officers *no later than November 25, 1952*. Applications received after that date may not be accepted and will be returned to the applicant.

MEDICAL SERVICES FOR MILITARY PERSONNEL

In order that civilian hospitals and physicians may be familiar with the only circumstances under existing laws whereby they can be compensated from appropriated funds for medical services furnished military personnel, the following information is furnished:

(a) Charges for civilian medical treatment furnished military personnel on duty or who are absent from their station on pass, sick leave, ordinary leave, or terminal leave and who are injured or become ill, are payable from public funds *only* when the required treatment cannot be furnished from nearby facilities of the Army or other Federal agency.

(b) Civilian hospitals and physicians should limit their treatment of military personnel to emergency conditions of an acute nature, as charges for treatment of chronic conditions or elective medical or surgical treatment *cannot* be allowed.

(c) Private rooms and special nurses should not be provided unless prior authorization therefor is obtained

from the Chief, Minnesota Military District, 1006 W. Lake Street, Minneapolis, Minn.

Military personnel who are absent from their station without proper authority (AWOL) are *not* entitled to civilian medical treatment at public expense.

In order to be assured of being remunerated for their services, civilian hospitals and physicians should conform to the following:

(a) On admission of a service man, hospital authorities should ascertain that the individual is actually in the active military service, and whether he has in his possession copies of orders authorizing absence from assigned station, and whether such orders authorize ordinary leave, sick leave or terminal leave.

(b) Immediately notify the commanding officer of the station to which the individual is assigned and the Chief, Minnesota Military District, 1006 West Lake Street, Minneapolis 8, Minnesota, of the fact of illness, by wire or letter, giving his name, rank, organization and the diagnosis.

(c) If an Army hospital or dispensary or any other Federal hospital or dispensary is located in the vicinity, telephone request should be made on that installation for ambulance transportation and required attendants to remove the patient to a Federal medical installation. No patient will be transferred where it is thought that the transfer might jeopardize the patient's condition, however. Military authorities will be notified immediately.

MOBILE ARMY SURGICAL HOSPITAL

A recent announcement by the office of the Surgeon General of the Army states that the Mobile Army Surgical Hospital (MASH), organized just two weeks after the outbreak of the Korean war and located at its present position just behind the front lines since last October, has just treated and evacuated its 50,000th battle casualty. Helicopters and ambulances have brought in wounded troops for American, Korean, British, Canadian, Australian, New Zealand, Filipino, Turkish, Columbian, Ethopian, Thai, French, Netherland, Belgian, Luxemburg and Greek units. Hospital personnel takes pride in the amazing patient recovery rate of 99.8 per cent.

MILITARY SURGEONS' MEETING

Reserve officers of the medical services of the Army, Navy and Air Force will be given complete information on all new directives, including pending Congressional legislation, governing their commissions, active duty requirements and retirement benefits in one of the feature presentations of the fifty-ninth annual meeting of the Association of Military Surgeons which will be held at the Statler Hotel, Washington, D. C., November 17-19, under the presidency of Major General Harry G. Armstrong, Surgeon General of the Air Force.

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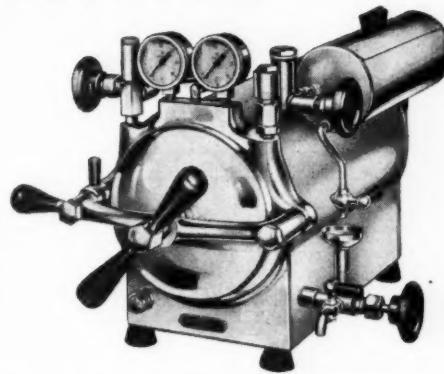
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Point credits for retirement will be given all eligible reserve officers attending the scientific session

President Truman has been invited to speak at the traditional banquet of the Association on the evening of November 19.

The program will include the following speakers: Louis H. Bauer, M.D., President of the American Medical Association; Dr. Otto Brandhorst, President of the American Dental Association; Melvin Casberg, M.D., Chairman, Armed Forces Medical Policy Council; Brig. Gen. J. A. McCallam, President-elect American Veterinary Medicine Association; Rear Admiral Lamont Pugh, Surgeon General of the Navy; Isador S. Ravdin, M.D., Philadelphia, Pennsylvania; Howard A. Rusk, M.D., New York City, New York; Brig. Gen. Oscar P. Snyder, Dental Corps, USA; Brig. Gen. William L. Wilson, USA, Federal Civil Defense Administration.

VA COURSE IN PSYCHIATRY AND NEUROLOGY

The Veterans Administration is instituting a four-month intensive training course in psychiatry and neurology to fit the needs of physicians without such previous training who are assigned to duty in twenty-two predominantly psychiatric hospitals. Physicians who have been engaged in general practice may request this training upon applying for a position at one of these hospitals.

The course will be held at the VA Hospitals in Coatesville, Pennsylvania; Palo Alto, California; and a joint Downey-Hines, Illinois, program near Chicago, Illinois. Physicians will be employed at salaries commensurate with their training and experience (salary range: \$5,500 to \$11,800 per annum) and assigned to the course with travel and per diem for the four-month period.

Information and applications may be obtained from your nearest VA Hospital or Regional Office, or by writing to the Chief Medical Director, Veterans Administration Central Office, Washington 25, D. C.

POSTGRADUATE COURSE, CHEST DISEASES

The Fifth Annual Postgraduate Course on the Recent Advances in Diseases of the Chest, sponsored by the Council on Postgraduate Medical Education and the New York State Chapter of the American College of Chest Physicians, will be presented at the Hotel New Yorker, New York City, November 10-14, 1952.

This course is open to all physicians, but the registration will be limited. Tuition fee is \$50.00; applications will be accepted in the order in which they are received.

A copy of the prospectus together with an application form can be secured from the: Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

This course has been approved for credits by the American Academy of General Practitioners.

Migraine In Children

"Migraine may appear during the first years of life. The presence of subjective signs, such as headache and flimmer scotoma, is often difficult to determine in young children. The true nature of the symptoms frequently remains obscure for years."

Vahlquist, B. and Hackzell, G.: *Acta Paediatrica* 38: 622 (1949).

NO. OF CASES	SEX	AGE AT ONSET	CYCLO VOMITING	DURATION OF ATTACK	INTENSITY
31	8 ♀ 23 ♂	3 yrs. (mean)	3 out of 31	2½ hrs.	severe in all cases

TABLE CONT'D

NO. OF CASES	UNILATERAL HEADACHE	NAUSEA	FLIMMER SCOTOMA	VERTIGO	HEREDITY
31	18 out of 31	31 out of 31	12 out of 31	6 out of 31	20 out of 31

(reference given above)

In a study of 400 adult migraine patients, it was revealed that 34% had suffered attacks before the age of 15.* These investigators concluded that childhood migraine was a much greater clinical problem than was previously believed and that psychodynamic mechanisms played an important part in the disease.

These criteria are useful in diagnosis:

Headache attacks with symptom-free intervals plus (at least two of the following) nausea, scintillating scotoma, hemicrania, and hereditary predisposition.

For symptomatic relief in these cases, Cafergot®, N.N.R. (ergotamine with caffeine) may be administered orally. For best results, give adequate dosage promptly.

For children within the age range 7 to 12 years—Cafergot® is administered, one tablet when the attack appears imminent followed by one additional tablet within 30 minutes. Not more than two Cafergot tablets should be administered to children within this age range.

In the adolescent age group, 12 to 18 years of age, the dosage may gradually be increased as necessary up to the usual adult dose, i.e., two tablets when the attack appears imminent followed by one tablet doses at half hour intervals until the attack is aborted. (Total maximum dose for adults: six tablets for each attack.)

*Katz, J., Friedman, A.P., and Gisolfi, A.: *New York State J. Med.* 50: 2269 (Oct.) 1950.

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GENERAL PRACTICE REFRESHER

The program for the second annual Fall Refresher of the Minnesota Academy of General Practice to be held at Hotel Radisson on Wednesday, October 29, 1952, will be as follows:

8:20	Medical Film
9:00- 9:20	Tague C. Chisholm, M.D. "Treatment of Hernia in Children"
9:20- 9:40	Paul S. Blake, M.D. "Head Injuries"
9:40-10:00	R. N. Bieter, M.D. "The Antihistamines and Related Drugs"
10:00-10:20	L. A. Lang, M.D. "Local Anesthesia in Obstetrics"
10:20-10:40	Exhibits
10:40-11:00	Mr. Manley Brist "The Doctor and the Law"
11:00-12:00	Phillip Lewin, M.D. (Chicago) "Painful Feet"
12:00	LUNCHEON
	Philip Thorek, M.D. (Chicago) "Jaundice"
2:00- 2:40	To be discussed by Cecil J. Watson, M.D. Symposium—Skin Disease: E. T. Ceder, M.D., and Orville Ockley, M.D. "Treatment and Management of Dermatitis"
2:40- 3:20	Symposium—Office Gynecology: Melvin B. Sinykin, M.D., and Lou's Friedman, M.D. (St. Paul)
3:20- 3:40	Exhibits
3:40- 5:00	Symposium on Hypertension 1. E. T. Bell, M.D. (Moderator) 2. A. C. Corcoran, M.D. (Cleveland) 3. J. E. Estes, M.D. (Rochester)
5:00- 5:30	Social Hour

Reservations should be made with Dr. Robert Quello, 730 La Salle Building, Minneapolis, Minnesota. There will be no registration fee. \$4.00 luncheon ticket is required for admission.

CONTINUATION COURSES

On November 21 and 22, the University of Minnesota will present a *Conference on Pemphigus and the Bullous Dermatoses* for dermatologists. The one-and-a-half-day session will be devoted to the consideration of the pathology, physiology, clinical characteristics, and treatment of the bullous dermatoses.

Several distinguished authorities in this field will participate: Dr. Herman Beerman, Chairman and Professor, Department of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, Philadelphia; Dr. Walter F. Lever, Assistant Professor, Department of Dermatology, Harvard University Medical School, Boston; and Dr. Stephen Rothman, Professor and Head, Section of Dermatology and Syphilology, University of Chicago. The course will be presented under the direction of Dr. H. E. Michelson, Professor, Department of Medicine, and Director, Division of Dermatology; and the remainder of the faculty will include members of the clinical staff of the University of Minnesota Medical School and the Mayo Foundation. The conference will be held in the Center for Continuation Study on the University of Minnesota campus.

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REPORTS AND ANNOUNCEMENTS

PEDIATRICIANS' SYMPOSIUM

Prominent researchers in the field of electrolyte metabolism (the way in which various salts are handled inside the human body) visited the University of Minnesota campus, September 22-24 for a national symposium on the metabolism of potassium (a salt found in the human body principally inside body cells). The three-day meeting which was of special interest to pediatricians, was sponsored by M and R Laboratories, Columbus, O.

Lecturers at the sessions in the Minnesota Museum of Natural History includes Dr. Daniel C. Darrow, Yale university pediatrics professor, who spoke on "The Role of Water and Electrolyte Deficits in Infantile Diarrhea"; Dr. Willis H. Thompson, assistant pediatrics professor at the University of Minnesota, who talked on "Antagonism Between Sodium and Potassium in Their Effects on Glycosuria and Blood Pressure in Diabetic Children"; and Dr. Thaddeus S. Danowski, professor of research medicine, University of Pittsburgh, who discussed studies in diabetic coma and acidosis.

Two other speakers were Dr. Robert Trail, a colleague of Dr. Danowski's, on "The Relationship of Potassium Metabolism to Cardiac Function," and Dr. Howard B. Burchell, associate professor of medicine, Mayo Foundation, speaking on "Electrocardiographic Changes Related to Disturbances in Potassium Metabolism."

Dr. Irvine McQuarrie, head of the University of Minnesota's pediatrics department, was general chairman of the symposium.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Southern Minnesota Medical Association held at Austin, September 9, the following officers were elected:

President: Dr. H. J. Nilson, Mankato; First Vice President, Dr. William Bernstein, Saint Paul; Second Vice President, Dr. David P. Anderson, Austin; Secretary-Treasurer, Dr. C. F. Strobel, Rochester (re-elected).

Dr. John D. Dahlstet was awarded a medallion for making the outstanding case report, one dealing with Friedlander's pneumonia. The outstanding scientific paper was presented by Dr. L. M. Hammer, on the treatment of cutaneous malignancies.

UPPER MISSISSIPPI MEDICAL SOCIETY

The Upper Mississippi Medical Society met at Bemidji, September 6, with Dr. Maurice Mosby of Long Prairie, presiding. Dr. G. I. Badeaux of Brainerd is the permanent secretary.

Scientific papers were presented at the morning session. Dr. L. C. Lundsten of the Bemidji Clinic presented a diagnostic problem with its solution; Dr. J. W. Griffin, also of the Bemidji Clinic staff, gave his experiences with acute and chronic pancreatitis; Dr. A. H. Benson, urologist, Little Falls, outlined indications for cystoscopy and spoke on the more common urologic disorders.

Dr. Douglas Johnson, Little Falls, just back from an American Medical Association public relations meeting

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WOMAN'S AUXILIARY

at Chicago, spoke at the afternoon meeting. Dr. Charles Vandersluis of Bemidji, was in charge of the general arrangements for the meeting.

FAMILY NURSING SERVICE

October 16 to December 11 are the dates selected by Family Nursing Service, Wilder Health Center, Saint Paul, for the next series of eight classes for expectant mothers. The classes will be held each Thursday morning from 10 to 11:30 a.m. at the YWCA, 123 W. 5th Street.

The emphasis is placed on prenatal care to impress the expectant mother with its importance. The whole series is designed to supplement the physician's instructions.

The classes are taught by a public health nurse and the Nutrition Consultant. The subject matters include the anatomy, physiology of pregnancy, progress of child-birth, mental and personal health, child care, and development and nutrition. Emphasis is placed on nutrition, mechanics of labor, and care of the new baby. Nutrition is discussed with respect to its value to the mother during pregnancy and at time of labor and delivery. The importance of adequate nutrition for the baby during the prenatal period is also reviewed.

Registration fee is \$2.00. An expectant mother may enroll for these classes by calling Family Nursing Service, CEDar 0311 or GARfield 8181.

Woman's Auxiliary

AUXILIARY PLANS FALL MEETING

The annual fall School of Instruction of the Woman's Auxiliary to the Minnesota State Medical association will be held in the Hotel Saint Paul on October 10.

Auxiliary members will be privileged to hear Senator Edward J. Thye at the 12:30 p.m. luncheon. Following this, Mrs. James McDonough, Chicago, fourth vice president of the Woman's Auxiliary to the American Medical Association, will discuss organizational problems, and Mrs. Harold F. Wahlquist, Minneapolis, immediate past president of the national auxiliary, will report on the Minnesota Public Health Conference.

The morning session will include the Fall board meeting and will be followed at 10:15 a.m. by a public relations panel. Members will hear Wallace Fulton, Acting Director of the Division of Public Health Education, Minnesota Department of Health; Victor Cohn, science writer for the *Minneapolis Morning Tribune*; Jim Bornmann, news director, WCCO; and Mrs. Louis Minion, Home and Community Director for the Minnesota Farm Bureau Federation.

Following the afternoon speakers, auxiliary members will hold round-table discussions for instructing new committee chairmen in their duties for the coming year.

Mrs. Leonard Arling, Minneapolis, is chairman of the School of Instruction meeting.

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30 days of Nurse at Home	5.00 per day	10.00 per day	15.00 per day	20.00 per day
Laboratory Fees in Hospital	5.00	10.00	15.00	20.00
Operating Room in Hospital	10.00	20.00	30.00	40.00
Anesthetic in Hospital	10.00	20.00	30.00	40.00
X-Ray in Hospital	10.00	20.00	30.00	40.00
Medicines in Hospital	10.00	20.00	30.00	40.00
Ambulance to or from Hospital	10.00	20.00	30.00	40.00

COSTS (Quarterly)

Adult	2.50	5.00	7.50	10.00
Child to age 19	1.50	3.00	4.50	6.00
Child over age 19	2.50	5.00	7.50	10.00

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In Memoriam

WILLIAM PAUL EUGENE BERWALD

William Paul Eugene Berwald, former fellow in neurosurgery, Mayo Foundation, Rochester, Minnesota, died on June 11, 1952, in San Bernardino, California.

Dr. Berwald was born July 11, 1910, in Syracuse, New York. He received the degree of M.D. in 1935 from Syracuse University. He interned at the Syracuse University Hospital of Good Shepherd for one year, and was assistant to Dr. W. Williams and intern at Highland Hospital and St. Mary's Hospital in Rochester, New York, for one year. He entered the Mayo Foundation as a fellow in neurosurgery in July, 1937, and left the Mayo Foundation in June, 1939. He practiced neurosurgery for several years with Dr. W. Williams in Rochester, New York, after which he went to Patton, California, where he practiced neurosurgery until the time of his death. He was affiliated with Redlands Community Hospital in Redlands and Patton State Hospital in Patton.

Dr. Berwald was a member of Alpha Omega Alpha and Sigma Xi.

JUSTIN CHARLES LANNIN

Dr. J. C. Lannin, a practitioner of Mabel, Minnesota, since 1911, died on August 26, 1952, in Saint Paul. He was sixty-nine years of age.

Born at Winchester, Ontario, on July 11, 1883 he attended the local schools. He taught school before attending McGill University where he graduated in medicine in 1909. He interned at Montreal General Hospital and practiced at Caledonia, Minnesota, for a year before moving to Mabel.

In 1950, the annual picnic and get-together of the Newberg-Preble Farm Bureau was designated Appreciation Day for Dr. Lannin, in celebration of thirty-nine years of practice.

Despite a busy practice, Dr. Lannin devoted considerable time and energy to the civic welfare of Mabel. He served on the school board and was president of the board of directors of the Mabel Telephone Exchange Company.

On June 5, 1912, Dr. Lannin married Fannie Gordinier, who with their two sons, Drs. Donald and Bernard Lannin, both surgeons of Saint Paul, survives him.

EDWARD H. RICHTER

Dr. Edward H. Richter, physician at the State Hospital at Fergus Falls, died August 27, 1952, following a heart attack. He was fifty-eight years of age.

Dr. Richter was born May 13, 1894, at Foreston, Illinois. He grew up in Dell Rapids, South Dakota, and received his M.D. degree from the University of Minnesota in 1922. He practiced medicine in Hunter, North

Dakota, from 1923 until 1950, when he moved to Fergus Falls.

Dr. Richter married Alice Hartwell at Pierre, South Dakota, on September 14, 1920. His wife, a daughter Ruth, and a son Paul survive him.

RICHARD E. SCAMMON

Dr. Richard E. Scammon, well known in the field of anatomy and research and former professor of anatomy at the University of Minnesota, died at his home in Branson, Missouri, on September 12, 1952.

Dr. Scammon was a native of Kansas City and attended the University of Kansas. He earned the degree of Ph.D. in Medical Sciences at Harvard in 1909.

In 1911, he joined the University of Minnesota faculty in the anatomy department. In 1930, he accepted the position of dean of biological science at the University of Chicago where he remained for a year. He then returned to the University of Minnesota as dean of medical sciences. His was an investigative type of mind, and Dr. E. T. Bell is quoted as stating that it was a mistake for Dr. Scammon to let administrative work interfere with his research. He was a born teacher and ambidextrous in illustrating his lectures on the blackboard. While his research in human growth was outstanding, his originality was not limited to anatomy. He it was who worked out a pension system for the faculty of the University. According to Dr. Edward Boyden, now head of the University's department of anatomy, Dr. Scammon was an expert in mathematics, architecture, ecclesiastics and economics, as well as medicine. An entertaining talker, he was the center of attentive groups at medical gatherings. In short, he was that rare type of human being known as genius.

Dr. Scammon is survived by his wife, Julia, a son Richard M. and a daughter Jean. He was sixty-nine years of age at his death.

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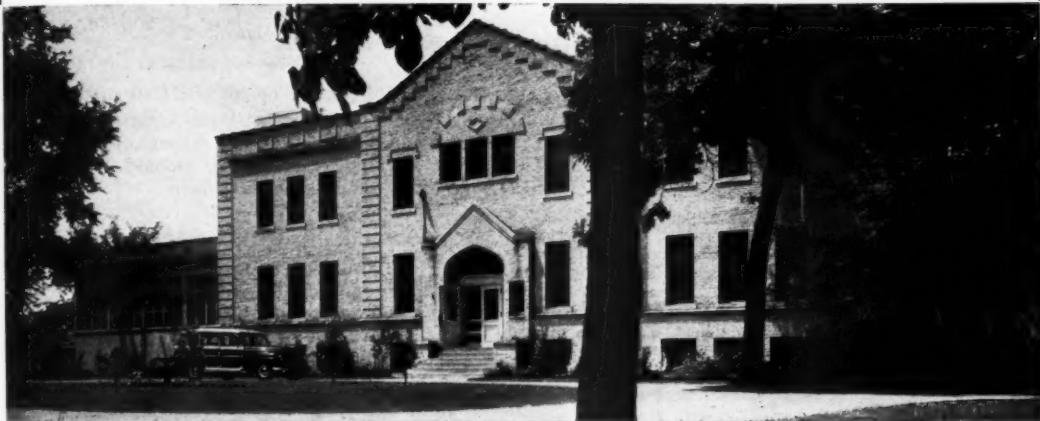
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♦ Of General Interest ♦

Dr. Troy Rollins held open house September 14 in a new clinic building in Elmore. Dr. Rollins' new office has a reception room, record office, laboratory, two examining rooms, x-ray and darkroom, consultation rooms and extras such as utility, storage rooms and toilets.

* * *

Dr. James M. Thompson began practice in Austin in September. Dr. Thompson formerly practiced at Brownsdale and just recently completed graduate study in gynecology and obstetrics at the University of Chicago.

* * *

Dr. John Rutledge, Detroit Lakes, accepted an appointment as resident in surgery at St. Luke's Hospital in Fargo.

* * *

Dr. Philip T. Bland of Wittenberg began practice in Westby in September.

* * *

Dr. Bruce Boynton left his practice in Ada, September 5, to go to Grafton, North Dakota. Dr. Boynton had practiced in Ada since the end of World War II.

* * *

Dr. O. H. Johnson, who has practiced in Redwood Falls since 1931, left to accept a fellowship in psychiatry and neurology at the University of Nebraska. Dr. A. W. Diessner of Waconia will take over Dr. Johnson's practice on September 8.

* * *

Drs. John Moe, R. W. Koucky, L. A. Stelter of Minneapolis; **John Doucky** of Chicago, and **A. H. Borgerson** of Long Prairie, left September 9 for a fishing trip in Alaska. They plan to fly by pontoon-equipped plane to various areas in Alaska for game hunting and motion picture taking.

* * *

Dr. S. Marx White, Minneapolis, was awarded the St. Barnabas Bowl, an achievement award giving recognition to the greatest medical contribution to the community. A year ago, Dr. White received the annual distinguished service award of the Community Chest and Council.

* * *

Dr. Marie Bepko Puumala left Cloquet August 26, to attend a meeting of the Medical Women's International Association in Vichy, France, September 14-16.

* * *

Dr. John Eiler of Park Rapids was elected to an associate membership in the International College of Surgeons at the meeting of the executive council on August 11.

* * *

Dr. John R. McDonald, surgical pathology at the

Mayo Clinic, left August 24 for South America where he will give lectures to medical groups in Quito, Ecuador, Santiago, Brazil, and Chile. Dr. and Mrs. McDonald will also do some sight-seeing on their month and a half trip.

* * *

Dr. Robb Rutledge of Detroit Lakes, now a flight surgeon in the United States Air Force, left September 2 for England where he will be stationed for several months.

* * *

Dr. G. N. Rysgaard joined the staff of the Northfield Hospital, September 9. Dr. Rysgaard will be associated with Drs. Stanley Kucera, L. B. Kucera, A. M. Nielsen, R. F. Mears, Donald H. Peterson, Bernard Street, and W. E. Wilson.

* * *

A refresher course for medical laboratory technicians in the Mankato area was begun September 16, and will run until November 11. Dr. A. G. Liedloff, director of District 2, Minnesota Department of Health, helped organize the course which is being sponsored by the Minnesota Hospital Association, State Medical Association, Society of Clinical Pathologists, Society of Medical Technologists, the University of Minnesota and the Minnesota Department of Health.

* * *

Dr. Norman Sterrie, Minneapolis, has joined the staff of the Worthington Clinic. Dr. Sterrie recently completed graduate work in pediatrics at the University of Minnesota.

* * *

A research fund of \$25,000 was contributed toward beginning a research laboratory at Minneapolis General Hospital by Archie D. Walker and his son, Dr. S. A. Walker. Dr. A. A. Zierold is president of the board of directors of the Minneapolis General Hospital Foundation, Inc. Dr. Daniel J. Moos, Dr. Walker and his father are members of the board. Dr. Zierold will be responsible for clearing individual projects.

* * *

A building permit was issued to **Dr. P. F. Meyer** of Faribault for a clinic at an estimated cost of \$25,000.

* * *

Dr. Maurice Weisberg returned recently from Canada where he and his wife attended a testimonial dinner in honor of Justice Samuel E. Freedman, who was elevated to the court of the Queen's bench for the province of Manitoba.

* * *

Dr. Robert M. Watson, recently discharged from the United States Army, has joined his father-in-

The Stability . . .

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law, Dr. A. I. Arneson, in practice at Morris. Dr. Watson served with the Army in 1945 and until he was again recalled to military service in 1951, he practiced as a member of the Bratrud Clinic in Thief River Falls.

* * *

Dr. Francis J. Schatz of Saint Cloud was recently honored at a reception celebrating his "knighthood" of the Order of St. Gregory the Great. "Knighthood" is given in recognition of distinguished service for the church, society and the Holy See. Dr. Schatz has practiced in Saint Cloud for forty-two years. Dr. Roger Kennedy, pediatrician at the Mayo Clinic and president of the Minnesota Medical Association,

was a guest speaker at the ceremony. Dr. Kennedy has been similarly honored by the Pope.

* * *

Dr. Kristofer Hagen, recently returned from India where he was a medical missionary, has begun practice with Dr. Theodore Greenfield at the Cokato Hospital.

* * *

Dr. Andrew A. Gage of Buffalo, New York, began practice in Maynard on October 1. Dr. Gage is associated with Dr. Herbert A. Hartfiel of Montevideo who has branch offices in Maynard and Boyd.

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Lieutenant Commander Carrie E. Chapman, USNR a former fellow in the Mayo Foundation, returned recently from London where she attended the International Congress of Physical Medicine at Kings College. Dr. Chapman is now serving with the United States Navy at the Oakland Naval Hospital, Oakland, California.

* * *

The Sixth Annual Minnesota Public Health Conference was held in Saint Paul on October 2 and 3. Participating in the program were: Dr. Viktor O. Wilson, Rochester public health officer; Dr. Charles Sheard, Rochester; Dr. Mary Giffin of the Mayo Clinic; and Dr. Charles G. Sheppard, Hutchinson, president of the State Public Health Conference.

* * *

Dr. A. B. Nietfield, who has been practicing at Warren, joined the Sauk Center Clinic on September 1.

* * *

Dr. Sorin Safirescu, a resident at Fairview Hospital, Minneapolis, was married September 1, to Patricia Gallagher, daughter of Minnesota Supreme Court Justice Frank T. Gallagher and Mrs. Gallagher. Dr. Safirescu was born in Rumania and attended medical school at the University of Bologna, Italy. He was at the Alexian Brothers Hospital in Chicago for a year before coming to Fairview Hospital.

* * *

Dr. Fred Schnell joined the staff of the Litchfield Clinic on September 1. He replaced **Dr. W. A. Chadbourne** who left the clinic to enter the Pathology Department at the University of Minnesota and Veterans Hospital. Dr. Schnell has been practicing at the East Range Clinic in Virginia, Minnesota.

* * *

Dr. C. G. Sheppard of Hutchinson spoke at the second of a series of regional health meetings authorized by President Truman, September 2, in Minneapolis. Dr. Sheppard is president of the Minnesota Public Health Conference and spoke on Minnesota's handling of health problems and gave reasons for the Conference's opposition to a compulsory health measure on a federal level.

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Dr. Mario M. Fischer, Duluth, acting director of District 4 office of the Minnesota Department of Health, and Dr. H. R. Irwin, pathologist at Hibbing General Hospital, assisted Sister M. Assumpta, R.N., administrator of Hibbing General Hospital, in planning a refresher course for medical laboratory technicians in the Hibbing and Duluth area. The course will be given on Wednesday evenings, starting September 17 and ending November 12.

* * *

Dr. Reno W. Backus, Director, Mobile Surveys, Nopeming Sanatorium, in co-operation with the Virginia Health Council, the Tuberculosis Health Association, and Nopeming Sanatorium, is conducting a "Pilot Study," in Virginia. The study, which will include the x-raying of specific groups, began September 18 and will help determine the practicability of another mass chest and x-ray survey.

* * *

Dr. William C. MacCarty, retiring member of the Mayo Clinic staff, was elected an international representative-at-large of the United States chapter of the International College of Surgeons, at a meeting in Chicago in September.

* * *

Drs. M. O. Oppegaard and C. G. Uhley, with their families, left Crookston, September 5, for an extended vacation trip through New England and the Atlantic states. Dr. Oppegaard and Dr. Uhley will attend a meeting of the American College of Surgeons in New York, September 22-25.

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MINNESOTA MEDICINE

Dr. Wesley Spink, professor of medicine at the University of Minnesota medical school, has gone to Spain to advise the government on methods for eradicating brucellosis from the livestock in that country where the disease is causing heavy losses. Dr. Spink is director of the Brucellosis Research Center of the World Health Organization. While in Europe, Dr. Spink will also visit France, Italy and Great Britain. Before returning to the United States he will attend a conference on antibiotic research in England.

* * *

Dr. Irving C. Bernstein of Minneapolis received a Master of Science degree in psychiatry from the University of Colorado. In June, Dr. Bernstein was certified in psychiatry by the American Board of Psychiatry and Neurology.

* * *

Dr. Eugene L. Bauer, of Saint Paul, will attend a postgraduate course in Bronchoesophagology in Chicago from October 20 to November 1.

* * *

Dr. Willard Peterson of Spring Valley was admitted to Saint Mary's Hospital in Rochester with poliomyelitis on August 28.

* * *

Dr. Daniel Lovelace began practice in Mountain Lake in late August. Dr. Lovelace will be associated with Drs. H. R. Basinger, E. S. Schutz of Mountain Lake and Dr. H. P. Basinger of Windom in the Basinger Clinic. Dr. Lovelace has been practicing in Rapid City, South Dakota, since his discharge from the army.

* * *

Dr. A. Cabot Wohlrbare, Minneapolis, was among those certified by the American Board of Internal Medicine early in the summer. Dr. Wohlrbare is associated with his father, Dr. Arthur A. Wohlrbare, in the practice of internal medicine with offices at 323 LaSalle Medical Building, Minneapolis.

* * *

Dr. J. S. Blumenthal has just returned from a two months' visit to Europe, where he visited England, Belgium, Switzerland, Italy and France. Dr. Blumenthal



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visited allergy clinics in London, Rome, and Paris. He was accompanied by his family.

* * *

Dr. Harry M. Weber of Rochester, Minnesota, is the new president-elect of the American Roentgen Ray Society. He will succeed Dr. Charles L. Martin of Dallas, Texas, in 1952.

* * *

Dr. Fred W. Rankin of Lexington, Kentucky, formerly associated with the Mayo Clinic, is the new president-elect of the American College of Surgeons as a result of the election held at New York in September.

BLUE CROSS-BLUE SHIELD NEWS

Blue Shield

On October 1, Minnesota Blue Shield's increased and revised Schedule of Payments went into effect. Also effective on the same date was the revised contract providing additional benefits. And all of these increased allowances or benefits have been approved and put into effect by the Board of Directors without any simultaneous or anticipated increase of the premium.

As these changes became effective, Minnesota Blue Shield had increased its benefits or fees four times during the first five years of its existence. On August 1, 1949, the appendectomy fee was raised from \$75 to \$100 and emergency medical care fees were added. On January 9, 1951, the policy of paying for surgical procedures

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Surgery of Colon and Rectum, one week, starting October 20, November 17.

Gallbladder Surgery, ten hours, starting October 20.

Bronchoscopy, one week, by appointment.

General Surgery, one week, starting October 6.

General Surgery, two weeks, starting October 6.

Breast and Thyroid Surgery, one week, starting October 6.

Esophageal Surgery, one week, starting October 13.

Thoracic Surgery, one week, starting October 20.

Fractures and Traumatic Surgery, two weeks, starting October 6.

GYNECOLOGY—Intensive Course, two weeks, starting October 20.

Vaginal Approach to Pelvic Surgery, one week, starting November 3.

OBSTETRICS—Intensive Course, two weeks, starting September 29, November 3.

MEDICINE—Intensive General Course, two weeks, starting October 13.

Gastroenterology, two weeks, starting October 27.

Gastroscopy and Gastroenterology, two weeks, starting November 3.

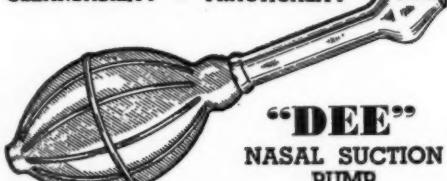
CYSTOSCOPY—Ten-day Practical Course starting every two weeks.

DERMATOLOGY—Intensive Course, two weeks, starting October 13.

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in the office treatment of surgical wounds and also as many as three subsequent surgical office calls represented a distinct increase in the Blue Shield allowances. And on May 1, 1951, the tonsillectomy fee for children under thirteen years of age was increased from \$25 to \$30. With the eighty-one fee increases now effective, this represents as rapid a rate of benefit increase as has been found in any Blue Shield plan in the country.

Among some of the more important present benefit increases are: (1) twenty-seven surgical operations, the fees for which have been increased \$50, raising them from \$150 to \$200, (2) addition of sixteen new items never before listed in the Schedule of Payments, (3) increase of in-hospital medical care from twenty-one to thirty days per illness during any twelve consecutive months, and (4) increases in the fees for emergency medical care for conditions hazardous to the subscriber's life. In addition to these, approximately fifty other operations or surgical procedures have higher fees than were paid under the old Schedule of Payments.

These benefit increases have been approved by the Board of Directors in spite of possible financial hazards associated with some of them. To avoid difficulties and to keep the road ahead clear for any future increases, the help of every member of the medical profession in avoiding abuses of the new Schedule of Payments is a vital necessity. With these changes, Minnesota's Blue Shield program becomes one of the most liberal of all the seventy-eight plans in existence. In this sense, it merits the profession's pride and deserves the cooperation of every physician.

Previous experience has indicated that the transition from one Schedule of Payments to another often requires double claims processing, leads to payment of allowances according to the wrong Schedule of Payments, and involves misunderstandings or disturbed physician and subscriber relationships. All of these can be avoided by filing all claims for services rendered prior to October 1, just as soon as possible after completion of the service.

These benefits or fee changes actually represent a colossal undertaking for the benefit of the subscribers primarily and the doctors who provide the service secondarily. Their effectiveness and the program's success are dependent upon the support and cooperation of the medical profession.

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Non-Group Enrollment Campaign Nears Close

As the sixth Minnesota Blue Cross-Blue Shield non-group enrollment campaign nears its close, inquiries are being received at an encouraging rate from all sections of Minnesota. However, doctors and hospital management factors are reminded again of the important role they can play in the mutual aim to bring voluntary prepaid hospital-medical and surgical care within the reach of every Minnesotan. Without utmost support and enthusiasm no amount of public relations effort can affect the substantially increased non-group enrollment needed to justify the most intensive campaign we have ever conducted.

Through daily contact with the public, doctors and hospitals are in a position to reach potential non-group subscribers at the grass roots level; and full co-operation in supplying patients and visitors with literature, applications and full information will go far to assure a successful enrollment.

Throughout the lengthened eight-week enrollment period, which commenced September 9 and continues through October 31, the enrollment campaign has the additional support of the powerful medium of television.

A new half-hour Blue Cross-Blue Shield television program over WCCO-TV (channel 4) is being broadcast every Tuesday night at 9:30 p.m. The program arranged in co-operation with the University of Minnesota is called "The Golden Gopher Cavalcade," and it

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WCCO-CBS radio continues to reach out to the public on a state-wide basis, with four, fifteen-minute broadcasts per week on Tuesday and Thursday nights at 6:30 p.m., on Saturday night at 10:00 p.m., and on

Sunday night at 7:00 p.m. In addition, during the latter half of the non-group campaign in October, newspaper messages are appearing in the *Minneapolis Star-Tribune*, *St. Paul Dispatch-Pioneer Press*, *Duluth Herald News-Tribune* and twenty-four out-state dailies.

To date, the new \$25 deductible Blue Cross non-group contract with its more comprehensive benefits is enjoying gratifying public acceptance as is the new non-group Blue Shield contract, which offers increases in the schedule of payments, number of days care and other added benefits *to become effective on and after October 1, 1952.*

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